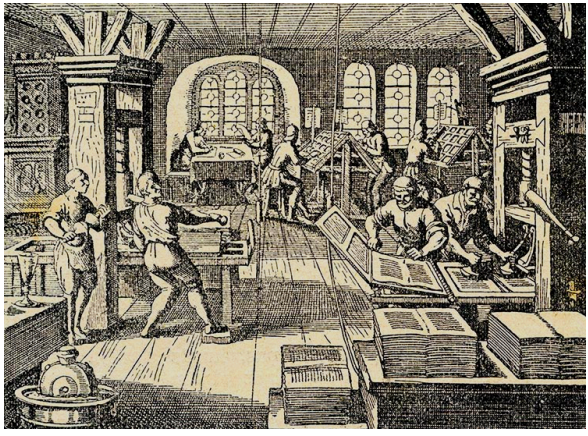
Uncommon Man
Unfinished Story

The Life and Times of John E. Arnold
1913-1963



John E. Arnold, Jr.

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For my children, Allison and Erik,
and their families

Who are we but the stories we tell ourselves,
about ourselves, and believe?

—Scott Turow

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John E. Arnold, c. 1955

Prologue

Hide not your talents, they for use were made,
What's a sundial in the shade?
—Benjamin Franklin

This is a biographical sketch of my father, John E. Arnold, a professor of Mechanical Engineering, first at the Massachusetts Institute of Technology in Massachusetts, and later at Stanford University in California. He died, middle-aged at 50, in 1963, while I was finishing my undergraduate work at Stanford.

He was a polymath[1] of psychology, engineering design, and teaching, and consulting, as well as music, dramatics, filmmaking and printing. He is most widely recognized for reconceptualizing engineering design, once narrowly viewed as drafting, into something vastly broader that required creative problem solving on a more comprehensive scale, always aiming for better solutions than those they replaced.

It seems odd to realize as I write this in 2023 that he has been dead for more years than he lived. Yet this is the only biography of him that looks at his childhood with the intent of identifying early signs of his creativity, imagination, and problem-solving skills, as well as his early interest in entrepreneurism and business. Did he stand out in a crowd of his peers or would it be hard to predict what his future would look like? Was it obvious he was on a path to uncommon achievements or was it surprising, given what we know?

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[1] Underlined words can be found as entries in the Glossary.

What do I mean by the term “uncommon man”? Simply that he was gifted with abilities, some of which fell outside the range of most people, and that his accomplishments, by their uncommonness, can be regarded as gifts, both to him and through his work to the rest of us. That point of view will guide the course of the biography.

Ex-President Herbert Hoover (Hoover, 1948) defined uncommon people in a telephone address this way:

> …It is a curious fact that when we get sick we want an uncommon doctor; if we have a construction job we want an uncommon engineer; when we get into war we dreadfully want an uncommon admiral and an uncommon general. Only when we get into politics are we content with the common man…
>
> Our full hope of recovery in the moral and the spiritual world is a wealth of uncommon men and women among our people. It is our educational institutions that must promote and train them.

Indeed most biographies proceed in this fashion because we are curious about people, different from ourselves, who achieve exceptional things. Perhaps we feel that by reading about them we may gain insights useful in our own efforts to find our way in a complex and competitive world. If so, it may help explain why we also enjoy mysteries and novels and movies—we get exposed to people, fictional or not, who know things we have yet to experience and learn.

In a deeper sense, common and uncommon people may not be so different. While innate differences can be exceptional so too can be the cultural and economic and social environments in which, for better or worse, the child matures. Nobody who lives a normal lifespan escapes this world without having been wounded and scarred to some extent, whether it be physically or emotionally, in ways that

influence the turns and paths of life they choose and the hard lessons they learn. The desire to help the next generation have a better life endures and stimulates much of the content that comprises our culture.

Do we benefit by such efforts? Does our quality of life improve? Do we live more fulfilling lives? Is there progress? We know that past civilizations have failed, be they Old World or New World, Egyptian, Grecian, Roman, or Aztec, Maya, or Inca. It suggests that our culture could at some point follow in their footsteps.

We have yet to figure out how to ensure everyone a nutritious diet, good health, a safe environment, equal opportunity to explore, discover, and create, or ensure equal protection and justice under the law. Much remains to be done. This is why John Arnold and his life's work should become familiar to us. His vision offers helpful methods and perspectives for us in this challenging life in which we find ourselves.

The Introduction which follows will attempt to inform the reader of what Arnold did in his adult life that others judged to be so unusual as to think of him as uncommon. What he thought and taught his engineering students distinguished him from his peers. It could make one wonder how he became the teacher, the psychologist, and the engineer who he was. He was different. How did it happen?

Introduction

> We cannot solve our problems with the same thinking we used when we created them.
>
> The important thing is to not stop questioning. Curiosity has its own reason for existing.
>
> —Albert Einstein

Little has been published about John E. Arnold's life, his childhood and how he lived life outside the educational institutions where he taught as an adult. What has been published about him came from his work in the engineering design courses he taught at the Massachusetts Institute of Technology (MIT) and Stanford University. It was there inside an MIT classroom that he did an unusual thing. It stemmed from his belief that his design students were not being as well equipped as they could be for the rigors of real world design needs.

Real world design problems by their nature could be solved in many different ways. Engineers could build any number of different bridges to get you across a river safely. The problem was figuring out which design best met the needs of the project: Who would use it: Cars, trucks, pedestrians, bikers, trains? What about materials? Styles? Ease of maintenance? Lifespan? Location? Flood control? Hazards? Costs?

The fact that the typical design problem had multiple right answers was itself somewhat of a problem. His students had largely mastered the engineering end of things, the science, the math, and the formulas. What

bothered him was the quality of the overall solution, which in his students' case all too often lacked imagination. To replace a bridge with a clone made no sense to Arnold unless a better solution could not be found, and that, he thought, would not happen often if the designer was doing his job well. Better solutions existed, they just required more imaginative and creative thought in order to be discovered.

So Arnold's problem as a teacher of design was to plan a better way to teach the subject matter to his students, one that required imaginative effort from his students in fulfilling their design assignments. Before Arnold, creativity was not typically taught to engineering students in a classroom or lab. It was not even clear that it could be successfully taught to students (or anyone else). For Arnold to go that route would require pioneering a new approach to instruction in which both instructor and student attempted the addition of creativity to the problem-solving recipe with the expectation of producing a better result.

Arnold applied his own imagination to the instructional challenge at hand and chose to inject some science fiction into the classroom, a new first for the MIT curriculum of the early 1950s. He created a fictitious planet and solar system for the star, Arcturus (Arnold, 1953, 2016).

Nothing about the planet, Arcturus IV, was similar to life as we know it on Earth. It was much colder there, its gravity much stronger, the atmosphere was largely methane and toxic to humans, plant roots extended into the atmosphere while the fruit grew underground. The intelligent beings who lived there seem to have evolved from birds, given their beak-like noses and light-weight, long-proportioned anatomy. Their language, mathematics, physiological reaction times, even their time-keeping

technology were alien to the Earthling explorers who made first contact with them.

Such being the case, Arnold's students had no choice. They had to use their imaginations in designing products for the inhabitants (the Methanians) of Arcturus IV. The students rose to the occasion. The best of the designs that the students produced went into a case study of the course which generated considerable excitement on and off campus. National media articles about Arnold's experiment were published in *Astounding Science Fiction, Readers Digest, Popular Science, Pageant,* and *Life*. The combination of Arnold's innovative teaching techniques and the students' creative product design work for the Methanians produced wide spread interest in many who saw much value in Arnold's novel approach to problem solving.

Arnold maintained that everyone is born with some degree of creative ability that could be further developed with training and instruction.

Creativity is not difficult to appreciate. If we had never gained the gift of curiosity or imagination or playfulness where would we be now…still sitting in caves with few tools to lighten the burdens of simple existence?

Curiosity motivates us to explore and discover and learn. It supports the growth of empathy, the emotional understanding we acquire of other people's inner lives, that facilitates relatedness to them.

Curiosity fosters relatedness and meaning in our surroundings. It prods us to question and learn more about that which we don't understand. We are seekers of meaning. Mysteries to us are relationships we don't yet understand, as in physics or chemistry, or as in human psychology where we can be mysteries to ourselves as

well as to others (See Human Beings in Glossary). Solving mysteries can be a highly satisfying, even profitable, business - just ask Albert Einstein or Agatha Christie.

Psychology as a college undergraduate major has long ranked among the most popular—evidence that people are naturally curious about themselves and others. But that interest starts long before college, at least by the time we hear our inner voice speaking words that nobody else can hear, telling us stories about ourselves and the world around us. Inevitably questions arise in our minds: Are you really as smart as you think you are? What do I have to do to make the first-string soccer lineup? How can I get so-and-so to look at me?

It seems common sense that if we become more adept at solving every-day "challenges" we will have an easier time progressing into our future. An overarching theme of this biography is exactly this: Can you **design yourself and your future?** While it is true that you will not be able to control every aspect of your life, e.g., your genome or changing the laws of nature, with persistence and wise choices, you should be able to create a "future you" that approximates the person you thought you might or could someday become. It will be a major objective of the biography to reveal how Arnold seemed to do it.

But let me be clear about one thing: how Arnold chose to go about designing himself does not require uncommonness to begin the process. The tools and the raw materials needed to begin the journey accompanied us at birth. Curiosity, imagination, intelligence, playfulness, emotionality and some interpersonal relatedness skills will get us on the same path that Arnold chose, that of problem solving and self-improvement.

Problem solving deals with both problems and solutions. When there is only one correct solution (2+2=4) life is simple. Complex problems are different. Many alternatives may be visible from the start and the issue becomes one of choice.Then again, it may be that no solution is evident at the beginning of problem solving. How will I choose when the car of my dreams is beyond my reach? What are my trade-offs? That will take us into the topic of personal identity, a second major theme of the biography, **Know Thyself**.

Common or uncommon we all share some attributes. Everyone is mortal. Each of us is imperfect in our own special way. We have flaws and limitations that can hinder our advancement toward the objectives we set for ourselves. Is our lack of endurance an issue? Are we too impatient? Do we give up easily? Does our lack of knowledge keep us from reaching our goals? Can you fly a plane without pilot training? How far can you get in life without knowing how to read and without paying attention to what you read? Is it helping you get where you want to go?

John Arnold's uncommonness may have gotten him on his path to the future faster and permitted him to travel farther than us. That is to be expected. But traveling the path has its own rewards and is not entirely dependent on speed or the distance covered. Common or uncommon, will any of us rid ourself of all questions and unsolved problems? Will not everyone be an unfinished story to some extent? The more important question seems to be whether or not we found a path that proved to be fulfilling.

How will the tools help us? They will help us become aware of our strengths and our weaknesses; they will help us to know better ourselves and others and the

environment around us. What are our special skills? What needs improvement?

Exploration, discovery, and experimentation are lifelong tools that can change our course. We do not know in advance if we will like every activity that we see others doing. It requires us to test the activity for ourselves and assess its worth.

That makes each of us responsible for uncovering our strengths, our preferences, our fears, and our dreams. That will at times require us to give a new activity a fair trial, before we make up our minds about continuing with it.

Can we summons the courage to begin it? How does one become brave enough to give it a try? If we are to design ourselves and our future, the mystery of who we are and who we can be must be faced.

That is another way of saying we seek an integration of our past with our present situation. If I can clearly see how my present state is related to past behavior and thoughts, I grow in understanding of who I am. I make a contribution to my identity. I can compare my past with my present state and note changes that I like and those that I don't like. What needs to change? What would I keep? What are my limits?

This serves to introduce a third major theme of the biography: **It all starts with a question**.

What doesn't start with a question? Well, for example, reflexes, some bodily states like hunger and sleepiness; a few emotions like pleasure and pain can start without a question first. But beyond autonomic responses and instincts, there lies a gigantic expanse of choice. What's the dinner menu tonight? How can I make friends with so-

and-so? Why did I just lose my temper? Why did I like that book so much? Why is that warning sign there?

I am suggesting that questions, when they get acceptably answered, are the means we use to create meaning and understanding in our lives. Hence questions are the starting point of the process that ultimately we hope will offer us better ways to attain our objectives.

Arnold in essentially all his lectures and talks stressed that very point. He also cautioned that the wording of the question might well influence the nature of the answer. For example, if most of the students in Mr. Jones' math class are flunking, and Jones asks himself, "Why do I get all the dull students?" he will not get the answer he needs, which in this case requires that the focus of inquiry be removed from the students and placed on the instructor.

At Stanford University Arnold was one of a number of faculty members who participated in a core liberal arts seminar curriculum from which all seniors picked one course for completion before graduation. Arnold's offering was titled "How to Ask a Question" and dealt with the intricacies of the questioning process itself. Besides the comments above on how wording of the question can partially determine the answer, Arnold also felt that the problem's nature itself was a big determinant of the quality of the solution.

With math problems there is only one correct answer: What is the average distance that separates the Earth from its moon? Mathematics, the sciences, and engineering often deal with the one-correct-answer problems. A second and larger category deals with creative problems that have many possible solutions that might work but no immediately obvious or best solution that would simultaneously eliminate the others from consideration.

So what can you do to generate more of the good candidates and less of the bad ones? The short answer is to use inclusive, less restricting terms in forming the question so as to facilitate a much broader range of candidate solutions.

In the 1950s and 60s about fifty thousand people were being killed in car accidents each year on US roads yet few Americans were concerned with the slaughter. Arnold advocated a comprehensive analysis of car accidents that was not just restricted to a safer car, but also considered the redesign of the road systems the cars traveled over: the on- and off-ramps, the locations of warning signs and signals to permit adequate reaction times, speed limits, and creation of emergency lanes for disabled cars to quickly utilize when trouble arose. Broadening the perspective of what the problem deals with, opens the door to a wider range of possibilities, encouraging creativity to enter as well. As Einstein said, "We cannot solve our problems with the same thinking we used when we created them."

I hope this abbreviated consideration of major themes of Arnold's work will convince you it is worth further inspection. You may share little formal interest in psychology, engineering, business, or teaching, yet I hope you can begin to appreciate that Arnold's work carries with it a potential usefulness to aid you in advancing your own cause. The better solution may not be the first one that comes to mind.

The biography will focus on his youth and the territory he traversed as he discovered more about himself and his identity. Identity changes as we mature. Muhammad Ali once noted that if you are the same person at 50 that you were at 20, you have wasted a lot of time.

The biography will reflect a holistic perspective of Arnold's development. That is, it will consider him in the context of those around him, be it his family, community, or nation; his past, present, and anticipated future; and his thoughts, emotions, imagination, and playfulness.

Arnold's mature development as teacher, psychologist, and design engineer is already covered in illuminated detail in a three-volume series initiated by William (Bill) J. Clancey, PhD. and polymath in philosophy, science, mathematics, robotics, design, and communication. Without his vision, energy, and leadership these volumes would not exist:

- In *The Arcturus IV Case Study (Arnold,1953, 2016)* we reverse-engineered its creation and the techniques Arnold employed to stimulate more imaginative and creative design from his students.

- *Creative Engineering (Arnold, 1959, 2016*) is the more formal intellectual presentation of Arnold's ideas on creative design as taught to corporate executives and industrial engineers.

- *The Philosophy of Comprehensive Design (Clancey, forthcoming)* presents Arnold's synthesis of the ideas behind what the individual designer should attempt to accomplish in the way of personal development in order to maximize his creative capabilities and realize his potential as a comprehensive designer and a human being.

It should be understood that this biography will not delve broadly into Arnold's adult professional life, as that is covered in *The Philosophy of Comprehensive Design*. The biography will however, consider his personal hobbies, a number of which originated in his youth and were practiced

for the rest of his life as beneficial explorations of the creative process.

As concerns this biography's source material, much came from my genealogical research of his paternal ancestors (Arnold & Paulsen, 2003) and the overflowing scrap books that his mother assembled of photographs, reports, letters, and other memorabilia from birth through high school. Additionally she kept a five-year diary covering the 1935-1939 period of his life which proved very helpful in understanding that crucial period of his development.

For most intents the biography will end as John and wife Helen, both in their mid 20s, depart Minneapolis for Cambridge, Massachusetts, and the beginning of his engineering education at MIT after having already received a BA degree in Psychology from the University of Minnesota. By then his adult identity had all essential components required for what was to follow. He knew then what he wanted to do in life. He had purpose.

However, before John Edward arrived on the scene his immediate ancestors had been in America for some 51 years. It is with them where we will start, for they provided John with a rather formidable foundation upon which he was to build his own life.

1: Family Origins

> Family, a link to the Past, a bridge to our Future.
>
> Families are like branches on a tree. We grow in different directions yet our roots remain the same.
>
> —Unknown

> You think your pains and heartbreaks are unprecedented in the history of the world, but then you read. It was books that taught me that the things that tormented me were the very things that connected me with all the people who were alive, or who have ever been alive.
>
> —James Baldwin

It will be helpful for the reader to understand from the inception a little known aspect of Arnold's journey to adulthood. He was born in Minneapolis to Edward and Florence Paulsen on March 14, 1913, and for the first twenty-four years of his life he was known as John Edward Paulsen. But three years after graduating from college, having been married for two years, he decided in 1937 to change his name from Paulsen to Arnold, just as he and his wife were departing Minneapolis for the rigors of Mechanical Engineering at the Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts, across the Charles River from Boston.

From this point forward in the biography I will refer to my father as Paulsen prior to the name change and as Arnold afterwards. If the time span includes both pre- and post-name-change periods I may use Paulsen/Arnold to try to avoid any confusion. I do this in part in hopes of facilitating the reader's appreciation of the uncommonness

of my father's act. The mystery surrounding his motivations prompted my genealogical investigation of his family heritage.

Paul Olsen (1822 - 1908), Great Grandfather of John E. Paulsen

The story of family origins begins in Norway on the Arneklev farm, which has existed since 1417, according to historical documents. It is located in the south-central part of Norway in the large Gudbrandsdalen Valley.

It is 1843 and Paul Olsen, age 21, is preparing to leave the farm permanently and head north 1000 miles to Tromsø, the "Wild West" of Norway at the time, where there seem to be opportunities for mining and fishing related work. Paul has blacksmith skills.

Tromsø is above the Arctic Circle at almost 70º north latitude. That means that depending on the season, you can experience either total darkness at noon during the winter or a bright midnight sun in the summer.

Why would Paul choose Tromsø? The short answer is that it seemed to offer relatively more opportunity there than elsewhere. The mining and fishing enterprises in the area could use his smithy skills.

A longer answer would include the fact that because he was born the seventh of nine children in the family, he stood no chance of inheriting any share of the tenant farm when his father died. It would all go to the eldest son. Then too, being a blacksmith meant he was unencumbered. He had no livestock and farm equipment to tether him to a farm. So off he went to Tromsø to test his abilities in a larger world.

A year after he arrived Tromsø church records show he married Tolline; son Edwin followed in 1848 (Appendix 3). It is thought they remained in Tromsø for most, if not all, of the years prior to immigrating to America in 1862.

What? Leave Tromsø and Norway! What was so bad with Norway? Again, the short answer involved opportunity. Tromsø was not an easy place to live and raise a family and the country as a whole lacked opportunity. Only 4% of its land was suited to growing crops and breeding farm animals. Norway's northerly location on the globe meant that crops would have a short growing season and be easily damaged by unseasonal weather.

With farm land scarce, demand for it would be high as would the price. Good farm land was owned almost exclusively by three small groups: the Crown, the Church, and the wealthy. Change of ownership was infrequent. Absentee ownership was prevalent, which meant that the land was worked by tenant farmers willing to pay the owner for the privilege of farming a small portion of land just large enough to support his family. Should the tenant farmer die, the oldest son had the right of primogeniture, whereby he acquired succession rights to the plot and assets of the tenant farm, with nothing claimable by younger siblings.

The Paul Olsen's family was not the only family that opted to immigrate to America. Since 1830 or so relatively small but growing numbers of Norwegians had left for America where they then sent back letters to Norway describing life in the New World.

The enthusiastic letters often were reproduced in Norwegian newspapers, and America quickly took on the aura of The Land of Opportunity. The rest is history. By 1900 there were more Norwegians and their offspring living in America than there were Norwegians in Norway. The

majority of them settled in the Midwest, especially Minnesota and Wisconsin.

There were two good reasons why so many Norwegians (and other Scandinavians) settled in the Midwest. Firstly, the preferred American entry points were from Canada via its St. Lawrence River. The "United" States was in the throws of a civil war and naval blockades disrupted East Coast ports of call south of Canada.

Secondly the American government was encouraging immigrants to establish roots in the territories and the new states of the Midwest, formed as the country expanded from East to West. Pioneers were needed for the difficult task of developing the prairie frontier into livable communities. To that end the government offered an enticement: 160 acres of land to anyone who agreed to settle on the land and improve its value through farming or ranching. The Homestead Act of 1862 received wide publicity throughout Europe and immigration to America boomed. To many Norwegians the offer held life-changing possibilities too good to pass up. In the days before mechanized agriculture, 160 acres represented a vast track of land.

The Homestead Act and successor acts were a huge success in attracting settlers. As a percentage of the country of origin's population, only Ireland sent more of its people to America than Norway did. They too were seeking a better life, a better future, if one were bold enough to seize the opportunity. You can see some Irish humor in the sentiment that Irish pioneers passed on to their children: "It wasn't for lack of 'want' that we came. We had plenty of that back home."

So coincidence or not, it was in 1862 that Paul, Tolline, and Edwin came to America. The Tromsø experience

offers us early evidence that Paul would be compatible with a demanding pioneer lifestyle. He spent almost 20 years in the far north of Norway with its cold, its long periods to reduced sunlight, and the 1,000 miles of separation from his former farm and home. He made an apparently good enough life for himself, his new wife, and his son under harsh conditions. If Paul could do well in Tromsø, the promise of America must have shone bright, indeed.

Edwin (1848 - 1896) and Anne (1859 - 1923), Grandparents of John Paulsen

In 1862 America was a young country of 74 years, a political experiment in representative democracy of uncertain outcome and life expectancy, a civil war underway.

Wisconsin had been a state for only 14 years and Minnesota only 4 years, when Paul, Tolline, and Edwin arrived at Coon Prairie, Wisconsin, where a colony of Norwegian immigrants had settled some years before.

During the eight years that Edwin spent there with his parents he met Anne and they married. A year later in 1870 Edwin, Anne, and newborn daughter, Louise, departed for Linden, Minnesota where they intended to homestead. Once established, Edwin's parents came to help with the farm. Edwin and Anne eventually produced ten first-generation Norwegian American children (five of each gender), of which the eighth born was Edward, the eventual father of John Edward.

Edwin died from unknown causes when he was only 47 in 1896 after several years of troubled health, but in his abbreviated lifetime of farming, he also served, at different times, as an auctioneer, Clerk of the school district,

Assessor of Linden Township, and member of the state Board of Equalization. In new settlements it was possible to wear many hats.

The children of Edwin and Anne as they matured left the homestead for North Dakota in search of their future as farmers, teachers, retailers and so on, attracted to the land and new towns that followed the railroad's transcontinental tracks to the West. The majority of Edwin's and Anne's offspring spent at least several years in North Dakota as homesteaders, teachers, or retailers before migrating further west or north into Canada. They were explorers.

Two of the younger sons of Edwin and Anne chose a different path. Thorwell found his way to Ford Motor Co. and Edward, headed to Minneapolis to the University of Minnesota and medical school, perhaps influenced by the health issues of an older sister and younger brother, both of whom died in their 30s.

Edward (1883 - 1939) and Florence (1887 - 1975), Parents of John Paulsen (1913 - 1963)

Edward (Ed) Ludwig Paulsen was the eighth born of Edwin and Anne's ten children. All grew up at the Linden, Minnesota, homestead farm. They were first-generation Americans, born of parents who as children had emigrated from Norway. Ed's older brothers all farmed or tried their hand in hardware or furniture retailing They followed the railroad westward. Edward escaped the farming/business path of his older brothers and instead attended the University of Minnesota, becoming a physician and surgeon by 1909. Three sisters became teachers.

Josephine, Edward's older sister closest in age to himself, was only 20 years old (1895) when she was elected Superintendent of Schools of Wells County, ND. It

achieved statehood in 1889. She retired in 1907 to marry Will Lierboe, a business school graduate, involved in the formation of the new town of Turtle Lake, ND, not far from three of her brothers who had settled in the area. Will and his brother Ted, had platted the town, and had created the town's first bank in 1905. It seemed towns could be invented out of thin air…and were.

It was to Turtle Lake that Edward went to begin his first medical practice in 1909. By 1911 he had built a small house across the street from Will and Josephine's home, and returned to Minneapolis to court and marry his sweetheart, **Florence Nicholson**, and bring her back to Turtle Lake.

Turtle Lake was a big change for Florence, who had grown up in Minneapolis as the daughter of a successful merchant. Ed and Florence's first child, a girl, was born prematurely, surviving less than a day after delivery. They moved back to Minneapolis after Florence became pregnant with her second child. It offered both better medical care for Florence and medical opportunities for Edward.

The pioneering life style that most of Edward's brothers and sisters lived was briefly experienced by John's parents. However, through correspondence and visits to Minneapolis, the relatives kept the Minneapolis Paulsens up to date with life on the frontier prairie. Apparently Edward had agreed to provide lodging and medical skills free of charge to any of them who requested his services. It is assumed (but not verified) that this arrangement served as repayment for their financial support of Edward's medical education.

Pioneering

Pioneering and homesteading have everything to do with transforming undeveloped land into useful agricultural resources. It was there for the bold, the adventurists, the self-reliant, and the hard-workers.

Besides wanting to turn wilderness into productive end products, the pioneer embodied the ambition of building better ways to satisfy a family's needs. If hardships could be mitigated through labor-saving technology, the impact on a pioneer's well-being would be immediate. The mechanization of farming was a direct result. So too was the creation of agricultural colleges, the science of botany, and the hybridization of seeds.

If this is beginning to sound like more modern times, it is because the values of the pioneers were incorporated into our culture and ethos. The necessity of better problem solving that motivated the pioneers was later felt by the design engineers of post-WWII America. Today "pioneering" refers to the development and cultivation of new areas of knowledge. It is what inventors do. Homage is paid to the historical pioneers with every new furrow made in the intellectual and technological prairies of today. Norwegian pioneers referred to their new home in America as Vesterheim, their western home. Their immense stature (Rölvaag, 1925) is a reflection of their ultimate triumph over adversity.

In such a place how could one not become aware of the need and the value of creative problem solving? The Paulsen family's pioneering heritage, as well as the zeitgeist of the early decades of twentieth century America, were steeped in pioneering values, as you will see in the next two chapters on the Roaring Twenties and Invention.

To this day the pioneer is revered as the icon of resourceful and triumphant perseverance over obstacles. In 1961 President Kennedy famously wondered if America could once again summons its pioneering spirit in an effort to land a man on the moon by the end of the decade. The same holds true for those among us who someday envision Mars as a frontier of human settlement.

As revered as the pioneer was in America at the turn of the twentieth century, the original pioneering days essentially ended with the initial settlement phase of America's vast interior. A second wave of industrialization followed, and the wilderness once so prevalent, was most easily found thereafter in the national parks created by the government, the first being Yellowstone in 1872 during the Presidency of Ulysses S. Grant.

The zeitgeist in the early decades of the twentieth century will now become our focus. It was a time of massive upheaval generated by World War I (1914-1918) and the Great Influenza (1918-1919). The decade of the 1920s was an exciting time to be living in America, especially if you were young.

Personal Note

Ed Paulsen's sister, Josephine, had an exceptional life as a North Dakotan pioneer. She and Will and Ted Lierboe, cofounded Turtle Lake and helped it grow. She and Will had three daughters and a son while living at Turtle Lake.

Will, besides starting the Farmers & Merchants Bank, built what was regarded as the "Cadillac" of barns. Paulsen descendants in the area in 2001 knew of the barn but did not know that the husband of a Paulsen woman had built it. Will died in 1923 of epidemic encephalitis (sleeping sickness); he was 45. Brother-in-law Ed attended his

medical needs when Will came to Minneapolis for treatment.

The bonds formed by Ed and Florence and Will and Josephine in early Turtle Lake days lasted for the rest of their lives. They shared time with each other in both Turtle Lake and Minneapolis. John Edward loved to spend summers with the Lierboe's son, Paul, at the ranch.

After Will died, Josephine, then a single parent, sold the ranch a few years later. She became Postmaster of Turtle Lake, and sold insurance as well. She received $20,000 from Will's insurance policy, which she gave to the bank when it got in trouble after the 1929 stock market crash, losing it all when the bank later failed.

Nevertheless, Josephine saw that her four children got a college education. She continued as a social worker in Bismarck. In 1949 at 71 years of age, she became North Dakota's Mother of the Year. Later that year in New York City for the National title, she was told she came in second place.

Josephine, blinded by cataracts, died in 1955 of cancer, cared for by one of her daughters. She was buried in the Turtle Lake Cemetery beside her husband.

I learned of her pioneer life and more after Tom Paulsen and I visited Turtle Lake in 2001. Tom and I were first cousins once removed, he being older. We had met some months before through an employee of the Brown County, Minnesota, Historical Society. Tom and I were not aware of each other's existence until Muriel Jeske figured out that Tom and I were researching the same family. Thereafter Tom and I collaborated on the family genealogy (Arnold & Paulsen, 2003). We took an extended road trip that summer. My sister, Penny, joined us for the Linden,

Minnesota, homestead part of the trip. The original barn was still standing on the site where Tom's father, Thorwell, and Ed and all the other siblings were raised.

On that same road trip Tom and I visited Turtle Lake. At 79, Tom was at times a bit impatient, and living in Texas for years, he had learned to just "stepped on it," that is, until the ND Highway Patrol thought better of it and pulled us over.

Upon arriving at Turtle Lake our first stop was at the cemetery. Would you believe we stopped directly in front of the Lierboe plot where Will and Josephine were seemingly awaiting us? That was quite a special moment for us. There were more that followed…for another time.

Tom and I finished our genealogical research two years later. But come to find out Tom had unfinished business. He returned to Minnesota to New Ulm near the Paulsen homestead to court Muriel Jeske, who had initially put Tom and I into contact with each other. They married and had five nice years together, often traveling, before Tom died in 2010. All of which goes to show you how meaningful genealogical research can be.

2: The Roaring Twenties

> The New Woman of the 1920s boldly asserted her right to dance, drink, smoke, and date—to work her own property, to live free of the strictures that governed her mother's generation…She flouted Victorian-era conventions and scandalized her parents. In many ways, she controlled her own destiny.
>
> —Joshua Zeitz

For just about anyone who had the good fortune to experience the Roaring Twenties, life must have been exciting indeed. It was a time of great energy and change, gaiety, innovation, wealth creation, and progress on many fronts. It was a time of optimism where it seemed anything was possible if one worked hard and was clever.

For John Paulsen, whose formative high school years closed out the decade, the timing could not have been better. As an enthusiastic participant he played well his part in ensuring that the decade lived up to its name.

The Preceding Decade

In the decade that preceded the 1920s there was planetary death and destruction on a vast scale. A world war and a global influenza pandemic were responsible for an estimated 65,000,000 to 100,000,000 deaths with another 20,000,000 wounded from World War I.

John Paulsen was born in 1913, a year before the "war to end all wars" began. The fighting ended with the Armistice signing in 1918. What followed in Europe was sardonically labeled the "peace to end all peace" as a mere 21 years later in 1939 resumption of fighting in Europe resumed as part of a global Second World War.

Essentially a generation of Englishmen gave their lives to the cause that bankrupted the British economy and wrecked the German economy with hyperinflation, stimulated by its post-WWI reparation payments to the victors of the war.

America entered WWI about a year before it ended, but that was long enough for its soldiers to note the differing European ways of living and looking at life. That, in turn, helped open America to cultural change in the aftermath of the war. American historians tended to view the dynamism of the 1920s as a period of partying, chaos, and madness against a backdrop of widespread social and political advocacy, the most notable being women's voting rights and the prohibition of alcoholic consumption.

The Great Influenza virus of 1918-1919, erroneously called the Spanish Flu, most likely originated in early 1918 in Kansas and quickly spread in the US and then to Europe as American soldiers and personnel mobilized for training on our side of the Atlantic before heading off to Europe and the war (Barry, 2004). The influenza's preferred age-group for infection were young adults, not the old, as might have been expected.

The war-time mobilization also had a stimulative effect on the American economy, which continued after the war ended as America began assuming a greater role in international finance largely because Great Britain had become overburdened with its war debts.

Zeitgeist of the 1920s

Gertrude Stein referred to the post-war Europeans as "The Lost Generation" for their difficulty in coming to terms with the absurdities and meaninglessness of the times. In America, F. Scott Fitzgerald labeled the era "The Jazz

Age." The French called it “The Crazy Years”; they were probably the most accurate.

The old ways of doing things no longer seemed satisfactory. The Great Influenza had prompted a major overhaul of the US healthcare and medical systems, one major change being a much-increased focus on the science of disease and its treatment. The global upheavals of war and disease would not easily permit a return to old ways once peace came and the pandemic subsided.

American women were increasingly empowered as their right to vote was granted in more and more states, and as Prohibition became law, largely due to their efforts. The social reform ideas of Upton Sinclair and Sinclair Lewis, and Edith Wharton gained traction. Our inner lives got an airing out by Sigmund Freud, Gertrude Stein, Ernest Hemingway, and F. Scott Fitzgerald, and likely stimulated new freedoms in dress and behavior—flapper dresses, the elimination of corsets, and the growing use of cosmetics, once limited to the domain of the “painted” ladies of the night.

Risk-taking was in fashion. It was the Age of Jazz, of dance, the Charleston, Breakaway, and tap; of dance contests, of speakeasies, of flirtatious women who smoked and drank cocktails. The air was loaded with energy and new standards of behavior.

With newly invented methods of mass-production, automobiles became more affordable and popular, as did the freedom to travel and explore. One of the most important differences between then and now was the optimism in the air. In 1918 only 8% of American families owned a car; by 1929 80% did. Electrification and telephones proliferated. Ford, Chrysler, and General

Motors dominated the industrialization of the country and were by far its largest corporate employers.

The American Dream was born. If one was clever and bold enough, and worked hard enough, the good life followed. Buy a home and a car; save and sacrifice so that your children could afford to go to four years of high school, even college. The American lifespan was increasing.

A high school education was sufficient to prepare you to enter the adult world of industry, get a job, and settle down and raise a family. A middle class family could get by on one income. Self-help was widely advocated. W. Clement Stone referred to the Bible as the world's greatest self-help book. Napoleon Hill preached that whatever the mind can conceive and believe, the mind can achieve. A generally shared cultural belief was that everyone had a chance to get rich. The stock market enjoyed a decade-long bull market and rewarded the brave with new wealth. It was a forward-looking time; the future appeared bright.

Technology

Aviation and the start of commercial airlines also contributed to expanding feelings of freedom. Charles Lindbergh was one of many daring barnstorming stunt pilots who performed aerial acrobatics and sold the public rides in their biplanes. He and later Amelia Earhart became national heroes for their long-distance aviation feats.

Radios, while expensive, were immensely popular as a mass broadcasting medium of entertainment and news that helped create a nationwide culture and advertising medium. The same could be said for the cinema and the new technology of adding sound to movies and news reel reporting.

Could anyone argue that the future was not filled with optimism about what was possible and what awaited us? Thomas Alva Edison had become a national celebrity through an unending parade of inventions that then supported business and the consumer. By the end of his life he held over 1000 patents to his name. He was a fountainhead of invention and wealth creation. First came his telegraph innovations, all bought by Western Electric. By 1876 he had built an invention laboratory to produce a major new product every six months. To that end he assembled teams of scientists and engineers to apply science in the service of technology that made life better. His incandescent light bulb grew eventually into the electrification of the whole nation.

The great bullish stock market of 1922-1929 fed the dreams of many that wealth was attainable in this land of opportunity called America. The Roaring Twenties truly were noisy. The air was filled with creativity, innovation, risk-taking, optimism, and entrepreneurism.

Simultaneity of Invention

Should the reader still harbor doubts about the zeitgeist's ability to influence the individual, consider this: Historians of invention and genius have noted that not infrequently inventions have occurred simultaneously or nearly so. Alexander Graham Bell and Elisha Gray both within days of each other applied for an acoustic telegraphy patent for an invention that led to the telephone. That both would think along similar lines at the same time suggests a common source of inspiration.

The same can be said for the development of calculus when both Isaac Newton and Gottfried Leibniz independently invented infinitesimal calculus in the late seventeenth century. Perhaps most impressively was the

independent development by both Charles Darwin and Alfred Russel Wallace of a science-based theory of evolution in the mid-nineteenth century.

The *New Yorker* article "In the Air" also claims that simultaneity occurred with decimal fractions, oxygen, color photography, logarithms, sunspots, the thermometer, the typewriter, and the steamboat (Malcom Gladwell (2008).

These examples imply that in a sense these feats were inevitable, that they were products of the intellectual climate of the time, that ideas existed independently in the zeitgeist, where they were accessible to others simultaneously. If one inventor failed, it mattered little as someone else could pick up the idea and give it a try. The inspiration—the ubiquitous sense of freedom and possibility—if not the idea, was "in the air," the same that John Paulsen would breathe in his formative school years, more than one hundred years ago.

3: Invention

> Talent hits a target that others cannot hit; Genius hits a target others cannot see.
>
> —Arthur Schopenhauer

The zeitgeist that preceded the Roaring Twenties was part of the Second Industrial Revolution that brought the telegraph, railroad networks, electrical power, telephones, and industrial mass production assembly lines. Inventors were heroes, and why not? They were clever. They satisfied real needs of people. They earned their wealth and fame.

Boys of that era had a number of role models they could study and try to emulate, none more accessible and famous than the fictional character, Tom Swift, whose adventures continue to this day in a published series of books that is over one hundred titles long and one hundred years plus in age.

I cannot tell you all the Tom Swift tales that John Paulsen read in his youth but I know that he did read some because as a mature adult in his late forties Arnold used the Tom Swift narrative model as the framework for a one-issue magazine Arnold concocted for a hobby-printer group he had joined, called The Companions of the Moxon Chappel.

The magazine was a very big deal (it is presented in its entirety in Chapter 8). The effort represented at least a month of spare time, according to the estimate given by one of its members, which well exceeded the norm for the usual standard of member effort, be it the composition, the

twelve pages of typesetting, its proofing and printing, page cutting or assembly. Yet who could doubt that every member of the Moxon Chappel hobby group had fond memories of Tom Swift and his many adventures and inventions?

The success of the Tom Swift book series illustrates how both zeitgeist and personal interest can combine to become part of one's identity. We can use this lens as we look into Paulsen's childhood for evidence that might suggest early interests compatible with engineering and psychology.

More broadly this inquiry will illustrate what Paulsen/Arnold might have learned about invention from reading biographies of noted inventors, for we know that Arnold sometimes laced anecdotes about them in his lectures and public presentations. The ones to be discussed now—Gutenberg, Leonardo, Franklin, and Edison—are acknowledged as great inventors and we know that at least Franklin and Edison were mentioned in Arnold's writings[2]. Arnold was a voracious and wide-ranging reader as an adult and it should not be a stretch of anyone's imagination to believe that he studied the lives of the recognized elite of invention.

The topic of invention poses several difficulties for a researcher. First is the issue of competition: You may recall that Leonardo da Vinci used to disguise some but not all of his comments that he wrote in his notebooks. For private thoughts about his ideas and drawings he would use "mirror" script wherein he wrote each line from right to left rather than the usual left to right direction. To read it easily

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[2] King Gillette and Edwin Land, Polaroid's founder, were mentioned by Arnold in some detail in Arnold, (1959) 2017, p. 76 ff., p. 103 ff.

one would need to hold the notebook page up to a mirror and read the mirror image. He did not bother with mirror writing for his public thoughts. So inventors may well attempt to protect some of their secrets of success from their competitors and the public at large.

Another complication is that inventing, especially in its initial phase, is unobservable as it occurs, being an intangible mental process that observers cannot see or hear as the idea becomes conscious. Where did it come from? It is only when ideas actually become visible as something tangible that we can begin to appreciate what the inventor was attempting to accomplish and how well he did.

It may also be the case that even the inventor does not fully understand the creative process. What control, if any, does the inventor possess to facilitate the process? Does the idea of a song or a painting or a hammer pop into your mind fully formed or does it start with a question or a problem in need of an answer?

We know Arnold was captivated by the challenge that the process raised, since he devoted his teaching career to making the process as explicit as possible. How does one generate new ideas—ideas which contribute to a solution? While Paulsen/Arnold likely was interested in both the process and what it produced, he regarded as more foundational the psychological process. It might explain why Paulsen first became a psychologist and only later an engineer. We will revisit this speculation later.

Lastly, I must acknowledge that I cannot itemize any specific inventive nuggets Arnold gathered from his biographical inquires. But given his curiosity, I find it highly unlikely that he did not harvest some. A nugget could have been as general as concluding that inventors' lives, while

exciting, often demand a lot of work and struggle before the finished product is perfected.

A nugget also could be as specific as the following fictitious example. Some of those who have studied Leonardo's life have noted that a number of his inventions were not entirely novel. That is, he took features from others' inventions and combined them into a new arrangement and purpose. A formerly wheeled cannon commonly used in naval warfare would be modified for mounting on tracks in a movable turret for more rapid repositioning in a battle situation, on land and sea. New uses of existing items are a big part of creative problem solving.

Tom Swift (1910-2007) and Entrepreneurism

I would guess that at least by the age of ten Paulsen was reading the Tom Swift series. He would have learned that Tom was a high school graduate. In Paulsen's time that was a rather small group, not more than 30% of that age group finished four years of high school.

Tom was clever and loved to tinker and invent, as did his father, who sometimes helped Tom in his adventures. The father was always quick to remind his son that any enterprise Tom got involved with must first of all contribute to the social well-being of the community. Profit must be secondary. Arnold would agree.

The series possessed a continuity of characters and after reading a few books in the series the reader knew what to expect from each. Tom in particular could be counted on to solve a mystery using his brains (important to Arnold) and then attempt to turn what had been invented into a for-profit enterprise. Paulsen, who started his own printing business, would agree.

At the end of each Swift volume was a brief postscript:

> Every boy possesses some form of inventive genius. Tom Swift is a bright, ingenious boy and his inventions and adventures make the most interesting kind of reading.

Whether Arnold adopted this quote for his own philosophy and purposes is debatable, but there is no debate that Arnold frequently stated that all people were born with creative potential which could be further developed through education and practice, to the benefit of the individual and society.

Furthermore, Arnold recognized the important role that business occupied in advancing innovation and growing the economy. His appointment to the Stanford Graduate School of Business symbolized Arnold's affinity with both engineering and business. He had spent a number of years as a business consultant and creator of summer seminars for corporate engineers and executives, teaching how creativity when applied to problem solving can boost a corporation's Research & Development (R & D) Division's productivity and the corporation's bottom line and longevity.

I think it plausible that Paulsen's involvement with invention deepened as he came to recognize in himself similarities with Tom and other real-life inventors—a shared curiosity and use of one's imagination, a love of mysteries and the challenge of solving them with cleverness and intelligence. The more Paulsen read, the more he learned about himself; it became an adventure of self-discovery.

Johannes Gutenberg (c. 1400-1468) and the Democratization of Knowledge

Gutenberg was a favorite hero of Arnold's from pre-high school on. John and wife Helen later paid their respects to Johannes at the Mainz, Germany, Gutenberg Museum a month after disembarking in Rotterdam in 1963 while on sabbatical from Stanford. Gutenberg's fame derived from his invention of movable cast metal type, representative of the individual letters of an alphabet, marks of punctuations, Arabic numerals, and a few other decorative symbols called dingbats. Moveable ceramic characters were in use in China in the eleventh century but each represented a whole word (of which there were thousands) rather than the much more limited sounds of a spoken language (phonemes) that were captured with a twenty-six letter alphabet. In actuality, European printers needed about one hundred symbols because of upper and lower case letters, numbers and special characters of punctuation and expression.

Movable type, dramatic as that was, needed to be accompanied by other innovations that Gutenberg had to solve before the 180 first-edition printed copies of the Bible (c. 1455) could be produced. For example, the recipe for ink had to be altered to have it better adhere to the paper (not parchment) being used. Then a new way to apply the ink to the cast metal heads of type had to be found so that less smearing occurred when paper was pressed against the inked type. And how do you align the paper (also a Chinese invention) so that the back-side rows of the printed page were perfectly aligned with its front side rows? Gutenberg figured it out.

Gutenberg's technology was immediately recognized by others in the trade as an important improvement and

was widely adopted. The new technology impressively cut the cost of books, and books spread into the hands of many who previously could not afford them. Literacy grew, as did the need for eye glasses and libraries.

The books, being printed and not handwritten, instantly became authoritative copies of the same edition; each was identical to the original. (With today's digital book publishing technology, how do you know if your copy of a book is identical to the original? Digital editing skills, word-processing computers, scanners, and digital printers and cameras are all too readily available).

Another consequence of Gutenberg's technology was Martin Luther's Reformation of organized Christianity. Formerly only priests possessed Bibles due to their expense. The laity had no choice but to accept what the priests said about its contents. All of that changed when Bibles became more readily available. People could read, reason, and compare what the Bible said to what their priest reported it as saying. It did not hurt that Luther had 200,000 copies of the Bible printed and distributed to the populace. University libraries were built to house the growing number of published books and helped to create the Age of Enlightenment during the seventeenth and eighteenth centuries—unanticipated positive consequences of the Gutenberg fifteenth century technology.

A further positive consequence was the development of better optics. Lenses, be they for reading glasses, microscopes or telescopes became the tools for the collection and dissemination of scientific knowledge. It was revolutionary.

It is refreshing to be reminded that not all unintended consequences of innovation are negative. Gutenberg's work had so many positive ones that he is regarded as

perhaps the most influential mortal to have ever lived. Arnold's insistence that problem solving must generate better solutions can in part be understood as arising from his appreciation of Gutenberg's work and its consequences.

Leonardo da Vinci (1452-1519), A Renaissance Icon

Leonardo is one of the most famous polymaths of all time, being renowned for his contributions to art, architecture, anatomy and many other fields of knowledge. Who is not aware of his paintings of the Mona Lisa, The Last Supper, and the Vitruvian Man? His painting talent almost single-handedly defined the High Renaissance of the late fifteenth and early sixteenth centuries. His unpublished notebooks revealed vast engineering knowledge and inventiveness, including a flying machine, scientific understanding of human anatomy, paleontology, and more. Leonardo became the archetypal Renaissance Man, accomplished in essentially all areas of knowledge at that time.

Arnold revered Leonardo as a fully actualized man, unlikely to be ever replicated again as knowledge and its growing breadth, depth, and complexity outraced what any one individual could be expected to master in a single lifetime. Each general area of classical knowledge grew into multiple sub-specialties, as did the educational curriculum of its students. A diversified team of specialists became necessary to present a comprehensive overview of a traditional area of knowledge.

Psychology was split into Normal, Abnormal, Clinical, Developmental, Behavioral, Cognitive, and more. Engineering education was split into Mechanical, Electrical, Civil, Industrial, and so on. Polymaths could still make uncommon contributions to society, but in a more

specialized fashion. The Renaissance ideal of mastering all of knowledge would have to be postponed until a Theory of Everything came along. Until then the conception of Arnold's Comprehensive Designer, as a life-long student of science, engineering, and the humanities would remain as a worthy but seldom unattained goal in Arnold's philosophy of self-development. How else could one's creative potential be maximized?

Benjamin Franklin (1706-1790), A Founding Father in Every Sense

It is humbling to write of the life of Benjamin Franklin; he had so many achievements attached to his name. He was a polymath extraordinaire: writer, publisher, humorist, scientist, inventor, political philosopher and activist, educator, and more. My comments will be limited to those feats to which I have reason to believe my father was most attracted, namely his efforts to define the zeitgeist or ethos of the country as it transitioned from Colonial to Independent political status. His contributions at that pivotal point defined him as one of the Founding Fathers of the United States.

I will assume my father first became familiar with Franklin in elementary and high school American History classes. My father was active with his high school newspaper at that point in his education, just as Franklin had been for most of his life. The *Philadelphia Gazette* gave Franklin a civil and political voice during the colonial days; Poor Richard's Almanack gave him a platform for humor and wit. Poor Richard called himself a philomath, a lover of learning and study, both close to Arnold's heart, as would be Franklin's use of humor and wit. This enabled the public promotion and discussion of values like education, work, frugality, and egalitarianism in the pursuit of life,

liberty, justice, and happiness, all helpful values for a young republic to promulgate.

He was a drafter and signer of the Declaration of Independence, founder of the first Firefighters Association in America, founder and first President of what became the University of Pennsylvania. He invented the lightening rod, bi-focal lenses, and the Franklin stove. He charted and named the Gulf Stream oceanic current from transatlantic observations he made on trips back and forth to Europe. During the Revolutionary War he served as Ambassador to France and engaged them as an ally and arms supplier to the cause. He was appointed the Postmaster General of the new United States and put in place the communication lines and services that the country required if it was to gain a sense of national identity. You might say he helped to engineer the internet equivalent of his day.

I think my father came to associate Franklin as the Renaissance Man of the founding days of the Republic. Another way to say it would be that Arnold saw Franklin as a Comprehensive Designer of the period and the country. He had been involved on the international, federal, state, and local levels in many different ways.

Similarly the pioneer times of the Paulsen family were about creating the infrastructure of settlement—the new towns and the agricultural and industrial economies, the transportation and the technology. The active effort to create settlement revealed what systems were essential for successful settlement. It made more obvious the complex nature of the task, that is, the need for comprehensiveness in design.

Our family's 1957 move from Massachusetts to California must have expanded his awareness of how California developed. Leland Stanford's university largely

was funded from a fortune that came from his transcontinental railroading successes. There was no secret about that. Arnold's interest in the California experience of the nineteenth century is clearly seen in the poster series he produced of that era with his hobby press: Clipper ships, Pony Express, San Francisco, and the Gold Rush days.

A final observation of Arnold's interest in the creative opportunities of society-shaping during times of turmoil is evident by his investment in a fallout shelter for his Portola Valley property. In 1961 President Kennedy in a national speech had recommended that those citizens who could afford to do so, should get a shelter, given the increasing concern over nuclear war with the Soviet Union. The Cuban Missile Crisis of the following year greatly accentuated the fear. Many government-financed public shelters were created then as well.

I remember asking my mother why my father had built a shelter for us. She replied that he felt he could be of service in the rebuilding of society that would follow any nuclear war. Was he thinking of Franklin in his role of crafting the Republic?

Thomas Alva Edison (1847-1931), Industrial Research & Development

Thomas Edison bookends the inventors in this collection who seemed particularly inspirational to Arnold. Edison was 63 when Tom Swift appeared on the scene in 1910. By then Edison was well known worldwide for his incandescent electric light bulb and the power generation utilities that he established to supply the electricity needed for their use. By the time Edison died in 1931 he had accumulated an astonishing record of 1093 patents,

including the phonograph and movie camera—a lifetime of inventiveness.

He was a true celebrity and likely one of the inventors of the day whose accomplishments inspired the Tom Swift series of books. The business model Edison incorporated within his Menlo Park, New Jersey, Research Lab had the goal of introducing a new product every six months or so that would keep the business growing and profitable. To that end Edison hired numerous scientists and engineers needed to turn ideas into something tangible.

He reportedly had a formula to accomplish that goal: 1% inspiration and 99% sweat. Arnold would have preferred a more productive formula built on greater inspiration and less sweat. Most people, however, who didn't understand the science and technology incorporated in a new product, probably did not grasp the sweat portion of Edison's formula. It was easier for them to imagine Edison waving a magic wand of invention than to appreciate the work that invention requires as it becomes real.

Perhaps it was for that reason that Edison was dubbed the Wizard of Menlo Park (and the modern Father of Invention for all his patents).

Edison was the first to formalize innovation as a fundamental raw material of business. Tom Swift could admire such business acumen. Edison's model spread widely as other corporations set up their own R & D units. Thomas J. Watson, long-time Chairman and CEO of IBM described creativity in business this way:

> Once an organization loses its spirit of pioneering and rests on its early work, its progress stops.

General Electric employed the slogans: “We Bring Good Things to Life” and “Imagination at Work.”

Edison’s strategy illustrates the importance and the benefits of focusing on both the inventive *process* and the *product*. When businesses recognized the importance of innovation for their own firm’s growth and longevity, they also must have realized its vaster significance to the country’s national economy. The wealth that centers of learning like MIT and Stanford have stimulated with their graduates’ entrepreneurial successes has transformed our economy and caused other nations to emulate our model of growing an economy by making daydreams real.

Inventors and pioneers have commonalities. Both are bold and willing to strike out in new directions, accepting the possibility of failure and the unknown costs involved. Both must be good problem-solvers and possess not only confidence in their abilities but also resilience when solutions are evasive or absent.

I have already noted that John Paulsen came from a family with strong roots in pioneering and that culturally the pioneers became nationally admired heroes. The same held true for the successful inventors of the two industrial revolutions. Paulsen had plenty of models to choose from in fashioning his own identity. By age nine he professed interest in becoming a medical missionary; by age twelve he was busy with his printing press and later his Washburn Print Shop. The self-determination he exhibited at a young age shows the character he was developing.

Paulsen’s Early and Middle Childhood Behaviors

The scrapbook Florence kept of her son’s development gives one the sense that John Edward was an easy child to attend to, whether at home or school. An extrovert, he

enjoyed adults and children and he could find objects around him that occupied his interest. His mother wrote he did not need to be encouraged to practice the piano or the violin; he enjoyed the practice. By age 9 he took the trolley car to music lessons. Homesickness was never a problem, be it attending a summer camp or visiting his cousin in Turtle Lake.

He loved books. Before his fifth birthday he was given the *Book of Knowledge* encyclopedia. He learned to read in the first grade. He wore eye glasses from the time he was eight.

His insistence on joining the Baptist church led to his unusually early baptism at age nine. Church elders found him sufficiently mature to qualify. He was voted President of his fourth grade class. John had begun to determine his own identity.

John's first exposure to kindergarten occurred shortly before his fourth birthday. His teacher told Florence he had exceptional drawing skills for his age. For many Christmases and birthdays thereafter John was given pencils and pens, cases to hold them, and drawing (drafting) boards to support his work, evidence his drawing had become ingrained.

Drawing proved to be of livelong value to John. As an adult, he taught mechanical engineering drawing courses in universities and included humorous sketches in his presentations. It was a skill helpful in problem solving and design work (McKim, 1972).

John did not have to draw; he chose to. He continued to draw because he found it intrinsically rewarding; it was an enjoyable activity. He likely wanted to get better at it, and that would require him to explore, experiment, and

discover new techniques and skills. One of the rewards for doing so was the growing confidence in one's ability and talent, the kind needed in problem solving.

Drawing is a helpful part of design and links to photography, where visual patterns, black and white ones in Paulsen's day, could be captured. Could he sketch accurately what a photo detailed? Could he learn thoroughly the dark room skills of turning exposed film into negatives from which positive prints could be generated? Could he figure out what was needed to take better photographs, ones that more closely approximated the work of professional photographers? How could he utilize that knowledge with his printing press hobby or his filmmaking? Each hobby was different but also related to the others.

Photography, filmmaking, and letter-press printing were all to become lifelong hobbies for John and perhaps now we know one of the sources from which they sprang.



Florence Nicholson, 1905, "The Tasting"

Another likely source was his mother. As a young woman, she took art lessons and as a way of learning good artistic practice, she copied the work of an established master, in this case, Alessandro Sani (1856-1927) entitled "The Tasting."

She was eighteen when she painted it. Her father framed it for her as a wedding gift when she and Ed married in 1911. Her talent is immediately obvious but she never pursued painting after marriage. Her son was fortunate to have acquired genetically some of her talent. John as well had Gutenberg, Leonardo, Franklin and Edison for his inspiration, stimulating his curiosity, imagination, and love of discovery. None of these inventors had relied on formal education. They were largely self-taught or were learning directly from others, always guided by their own wits. They were competent and confident problem-solvers, resilient when impediments and wrong turns occurred. All were persistent in and dedicated to their work. They learned how to support themselves with their chosen work.

The time is now ripe for us to see how Paulsen chose to spend his time in his high school years, often regarded as an informative developmental period indicative of where one might be headed in the future. To repeat the Postscript phrase found in each Tom Swift book, it will make for very interesting reading.

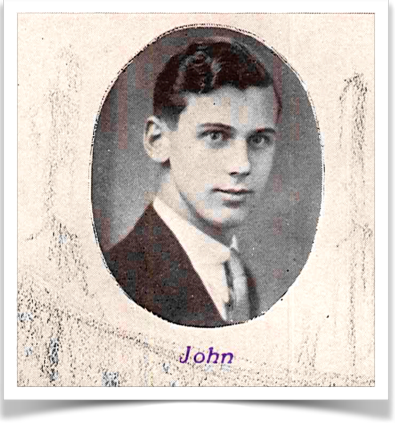
4: Washburn High School, 1927-1930

> High school is about finding who you are, because that's more important than trying to be someone else.
>
> —-Nick Jonas

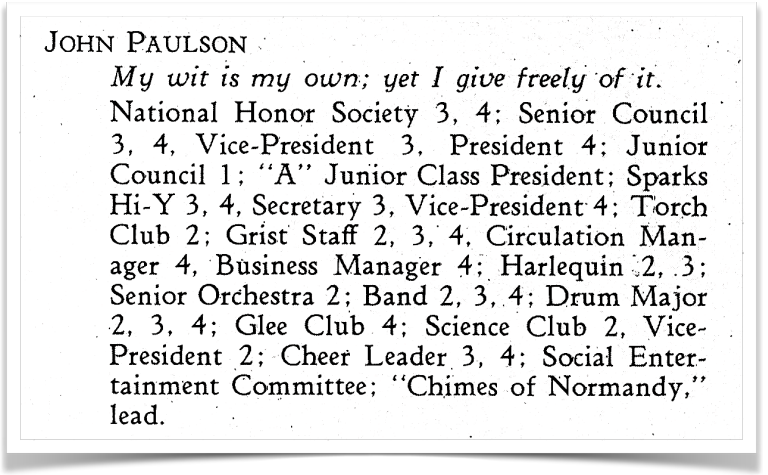
> The principal goal of education in the schools should be creating men and women who are capable of doing new things, not simply repeating what other generations have done; men and women who are creative, inventive, and discoverers, who can be critical and verify, and not accept, everything they are offered.
>
> —Jean Piaget

Washburn High was built in 1925 and even today it has the second largest enrollment of any Minneapolis high school. John Edward had started his senior year when the great Wall Street stock-market crash of October 1929 occurred. You might think of it as one of the last roars of the 1920s and the beginning howl of the Great Depression, which was to last throughout the decade of the 1930s.

Every senior in the 1930 Washburn Yearbook had a page devoted to themselves with a photo and summary of their four-year achievements, beginning with an informative one-sentence anecdote of themselves.



1930 WHS Yearbook Photo



JOHN PAULSON

My wit is my own; yet I give freely of it.

National Honor Society 3, 4; Senior Council 3, 4, Vice-President 3, President 4; Junior Council 1; "A" Junior Class President; Sparks Hi-Y 3, 4, Secretary 3, Vice-President 4; Torch Club 2; Grist Staff 2, 3, 4, Circulation Manager 4, Business Manager 4; Harlequin 2, 3; Senior Orchestra 2; Band 2, 3, 4; Drum Major 2, 3, 4; Glee Club 4; Science Club 2, Vice-President 2; Cheer Leader 3, 4; Social Entertainment Committee; "Chimes of Normandy," lead.

JEP's student activities, 1930 WHS Year Book

In John's case I understand the sentence to mean, "My witty intelligence is an important part of me and who I am; I enjoy sharing it with others." Given that the senior class selected him as "Most Popular" according to a news article pasted in his scrapbook, this seems an apt description.

John was an extrovert, a cheerleader and drum major and member of the Social Entertainment Committee. He was a leader, holding class officer positions and membership on the Senior and Junior Councils. Leadership training also included his participation in the Sparks Hi-Y and Torch Club where the emphasis was on applying Christian values in various community projects.

The same scrapbook article reported that John was picked as Most Talented, perhaps reflecting his good academic grades and membership in the National Honor Society and his commitments to the school newspaper, *The Grist,* where he started as a reporter and ended as both its Circulation Manager and its Business Manager.

Did you notice that his surname was misspelled in the Yearbook? The “e” in Paulsen was replaced by an “o” and not just on his individual page but also on many of the Group Activity pages where its group members were listed. It does seem odd that such a well-known student would have had that problem.

John was also outgoing in another sense of the term: he enjoyed performing before an audience. As Drum Major for the Marching Band, how could he not be noticed as he stood at the front of the band using his large baton to conduct their musical performance? He also was the lead actor in *Chimes of Normandy,* and member of the Senior Orchestra and Glee Club.

Future Predictiveness?

What stands out about Paulsen at this point in his life? Certainly his extroversion, intelligence and leadership qualities are notable. His love of music stands out. Paulsen began a lifelong interest in music at age seven when he began piano lessons. Violin lessons started when he was ten. He performed a solo Beethoven violin minuet in the seventh grade, and at church on different occasions.

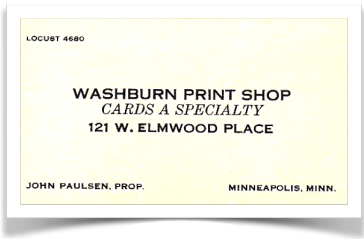
By the eighth grade Paulsen was playing in a harmonica group which continued in high school. At the University of Minnesota (UMN) he was one of over 200 Band members and in charge of its publicity. That earned him honorary membership in the Band’s Phi Sigma Phi Society. In his later working years he played Christmas carols on the piano and recordings of Sousa marches, Dixie Land jazz, and classical pieces on the home hi-fi stereo system.

Arnold’s lifelong love of printing began on his twelfth birthday, having persuaded his parents to give him a small

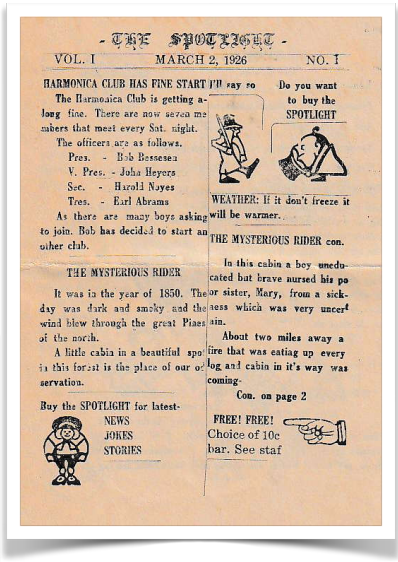


Kelsey 3 X 5

hobby printing press, a Kelsey 3x5, that he had seen in *Popular Science* magazine ads. So began a hobby that lasted for the rest of his life. Just one year later in the eighth grade he and four friends wrote and published a small, four-page humorous publication called *Spotlight,* which was printed by Arnold on his small press with limited fonts and graphics. Later he started his own printing business, the Washburn Print Shop. What may be less obvious is how quickly Paulsen was pushing the limits of his Kelsey. To attempt and succeed to produce a four-page newspaper on such a small press is remarkable. That it would also whet his entrepreneurial ambitions is something else.



Paulsen's business card c. 1928



"The Spotlight" c. 1926

Paulsen possessed an interest in learning the bigger picture of what it took to organize a musical performance and run a high school newspaper. Perhaps such executive

involvement portended Arnold's future interest in a comprehensive approach to design, given that his interests encompassed more than any single role in the activity to include essentially all the roles needed to run an orchestra or band or newspaper.

This speculation becomes more credible as we observe Paulsen's ventures into the dramatic arts in his high school years. He was Stage Manager of the senior class production of *Merry Andrew.* He learned both the mechanics of theatrical productions and the demands actors face in performing before an audience via his extracurricular activity with the Harlequin theatrical group.

Knowing his extroversion it is easy to believe that he loved theatrics, hamming it up a bit in playing to the audience, and radiating an assuredness uncommonly witnessed in high school performers. Such performance skills would be an asset for any professor facing easily distracted students. Lecturing to an early morning classroom of groggy male students, he was not above spicing up slides of gear assemblies with a few on the pulchritudinous design of the female form.

Dramatics are well suited for growing one's imaginative and empathic skills. What is acting if not the skill of convincing an audience that you are authentically someone else (and not "acting")? In all likelihood your roleplaying persona will differ from your own in numerous ways as it contrasts with your own personality and differences become accentuated. It is as if you are trying on new clothing, only in this case you would be trying on a new personality.

We can't be sure Paulsen knew which profession he wanted to pursue, but he already was engrossed in studying the nature of creativity. His explorations in music,

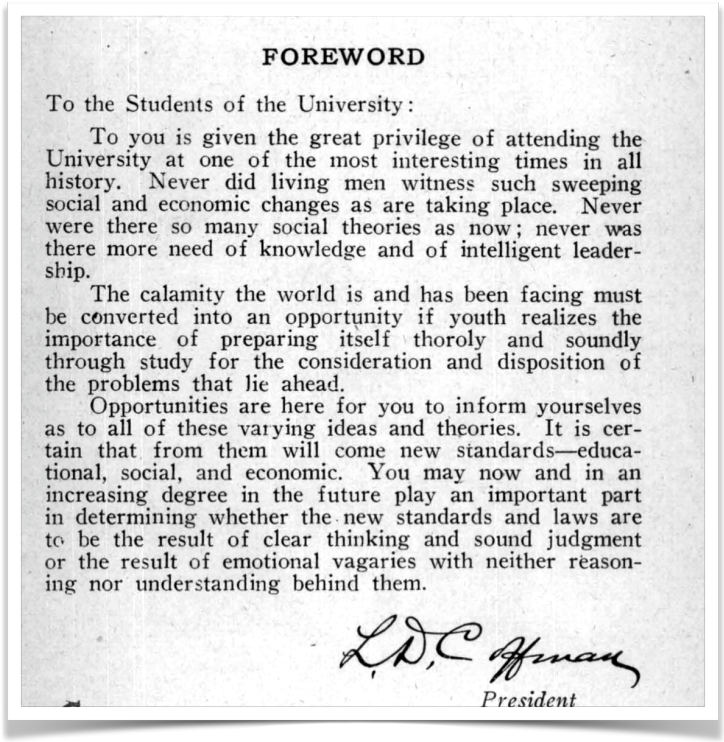
printing, and dramatic roleplaying offered insights as to who he was and what he found meaningful. Underlying all and aiding in the process were Paulsen's curiosity, imagination, empathy, and wit, especially the wit. Those aspects of one's personality often serve as bulwarks against complacency and conformity, mediocrity and predictability (Garner et al., 2024). As both psychologist and engineer Arnold regarded conformity as a major block to creative thinking. His prescient Yearbook one-sentence self-description is impressive evidence of a growing sense of who he was.

5: University of Minnesota, 1931-1934

A university is just a group of buildings gathered around a library. —Shelby Foote

Research is formalized curiosity. It is poking and prying with a purpose. — Zora Neale Hurston

Students attending UMN in 1934, the year Paulsen graduated, may have read President Coffman's greeting at the beginning of The Student Handbook. The greeting could have well represented the tenor of all four years that Paulsen attended:



FOREWORD

To the Students of the University:

To you is given the great privilege of attending the University at one of the most interesting times in all history. Never did living men witness such sweeping social and economic changes as are taking place. Never were there so many social theories as now; never was there more need of knowledge and of intelligent leadership.

The calamity the world is and has been facing must be converted into an opportunity if youth realizes the importance of preparing itself thoroly and soundly through study for the consideration and disposition of the problems that lie ahead.

Opportunities are here for you to inform yourselves as to all of these varying ideas and theories. It is certain that from them will come new standards—educational, social, and economic. You may now and in an increasing degree in the future play an important part in determining whether the new standards and laws are to be the result of clear thinking and sound judgment or the result of emotional vagaries with neither reasoning nor understanding behind them.

L. D. Coffman

President

1934 UMN Student Handbook Forward

From his high school days at Washburn, Paulsen brought to UMN a love of music, the theatre, and invention. He spent all four years at UMN participating in its very large band. Professional bands of the era played a powerful role in our national psyche during the ‘20s, ‘30s, and ‘40s. Duke Ellington, Benny Goodman, Glenn Miller, Cab Calloway, Count Basie, Artie Shaw, the Dorsey brothers, and many others ruled the ballrooms, jazz clubs, and the airwaves then.

National broadcasts of their driving, upbeat rhythms and music elevated many from their chairs and onto the dance floor. You could arrive in a grumpy mood only to discover how energizing and happy dancing made you feel. It was a great experience for your emotional intelligence. You opted to walk on the sunny side of the street (1930), maybe even fly down to Rio with Fred Astaire and Ginger Rogers (1933), or join Gene Kelly as he danced in the rain (1952). During the Great Depression it was a form of behavioral and emotional therapy on a nationwide scale and Paulsen was a very active member of it. Years later as I was growing up he was still talking about it: “it’s raining to beat the band” or “we were laughing to beat the band “ or “the crowd cheered to beat the band.” It was very difficult to beat a good band.

Paulsen handled the publicity of the UMN band as part of his job. He arranged with the university’s radio station to have band concerts beamed over the air on a somewhat regular basis, his personality an asset in his public relations efforts. It is possible that such experience helped him years later at MIT, as he sought to get his creative problem-solving message out to the general public via large national publications like *Astounding Science Fiction, Pageant,* and *Life*.

Dramatics remained an interest of his at UMN. He joined Masquers, a professional theatrics group. Garrick, a men's social club comprised of devotees of the theatre, welcomed him. Academically he excelled in the speech classes he took each year. Yet in coursework such as English Composition and English Shakespeare he received "D" grades, suggesting that he preferred speech over the written word in presentations.

His sociability needs found a further outlet when he became a member of the Delta Kappa Epsilon fraternity, which advertised itself as welcoming a diverse membership. Then too, he spent some time wooing his future bride at all-night dances.

Paulsen applied and was accepted into a two-year program called University College, created for those self-motivated students who did not want to be limited to a single major and sought to custom tailor their own program of study.

His academic transcript offers little evidence he was considering engineering, although he had two quarters each of chemistry and math (Bs and Cs). The transcript did show a good amount of subject matter exploration:

- Courses in law (contract law: D), and economics (accounting: C; statistics: incomplete), suggesting a business orientation.

- He took one course in philosophy (Problems: C), and three in anthropology (A, B, C).

- Unfortunately the transcript of University College offers nothing that would indicate the subject matter of Paulsen's guided readings in psychology. His good grades (As and Bs) indicated he liked those courses. It was his major.

Just before he graduated he took a course in vocational psychology (B) seemingly in preparation for a vocational counselor position. However, the timing could not have been worse. The Great Depression had produced a shrinking economy with high unemployment and very little employer interest in new employees, especially vocational psychologists.

Overall, the transcript seems consistent with a student very much in an exploratory stage of career commitment, with a bias for psychology.

In later years Professor Arnold became highly regarded as a polished lecturer and public speaker. It would seem four years of public speaking courses had a long-term positive effect on him.

After this overview of Paulsen's university days from both an academic and extracurricular point of view, I find it easier to believe that he was more interested in psychology or dramatics than he was in engineering, science and mathematics.

But since he did become an engineer, what am I missing? Oh, yes, lurking behind the scenes was his strongly developed interest in invention, genius, and creativity and how they combine psychologically during the inventive process.

One can speculate as well that the unexpected and sad ending of so many American dreams due to the Great Depression contributed to his interest in psychology because of the emotional depression left in the wake of the economic depression.

Whatever the case, he did show continuity of extracurricular intrinsic interests. He performed in at least two theatrical productions: a New Year's Eve parody of

Dracula (1929) in which he played the insane Renfield, and another which offered a dark view of *Broadway* (1931).

During the summer between his sophomore and junior years Arnold traveled the Mississippi River territory of Northrup, King and Co. selling their crop seeds to agricultural retailers. He visited New Orleans then, perhaps acquiring there his love of Dixieland jazz.

Post-UMN Employment.

The little that is known about Arnold's university days and his post-graduation work experience before leaving for MIT comes from an extensive article written by Morton Hunt and published in *Life* (1955).

What seems so striking in Arnold's account of his jobs then is the confidence he had in his own abilities, even though he lacked formal training or experience in the jobs he held then. Dates and durations of employment are unknown. As a night watchman at an oil plant he would read technical reports left lying on the President's desk. He found himself attracted to engineering, reminiscent perhaps of when years before he enjoyed *Popular Science* as a twelve year old, yearning for his first printing press.

The watchman job was followed by hands-on work and supervision of an auto service station in which he had purchased a share, likely with the help of some business capital supplied by his father or father-in-law. (John and Helen were married in 1935. Her father was a successful fuel oil merchant).

Paulsen's last known job before leaving the Minneapolis area for MIT, was as an assistant designer in a small machine tool company. Once again he began with no practical experience in machine design, having only read

an introductory text on drafting the night before he began work.

His confidence got a boost when he designed what he thought was a superior variable speed drive mechanism. The model he built functioned well and led to more of them being manufactured. In the process he became aware that he lacked the math and engineering background to determine whether his design would hold up under real physical conditions of stress. The realization convinced him he needed more schooling, and so began the process which resulted in being accepted into the mechanical engineering program at MIT in the fall of 1937.

Paulsen's high school and college days reveal a growing alignment between his inner and outer worlds. His sociability, curiosity, inventiveness, playfulness, and humor developed and found expression in public musical and dramatic performances as well as an ease in forming interpersonal relationships. He aligned well with the zeitgeist's values of inventiveness, entrepreneurship, and serving a greater good as seen in his various leadership roles in school and extracurricular activities.

His intrinsic curiosity and attraction to the mysteries of invention were motive and compass, impetus and direction, of inner and outer life. His identity grew accordingly. His self-initiated explorations into drawing, music, journalism, and acting gave him confidence in his own abilities to design and problem-solve his path to his future. However, as much as we might think we are in control of our own destiny, life will find ways to remind us that our control is limited.

6: Identity and Name Change, 1937

> What's in a name? That which we call a rose
> By any other name would smell as sweet.
>
> —William Shakespeare

> The value of identity of course is that so often with it comes purpose.
>
> —Richard Grant

Identity

Paulsen was a 24-year-old young man, already married for more than two years when he legally changed his surname from Paulsen to Arnold with the approval of his wife, his parents and his in-laws. That was in 1937. The country was still in a deep economic depression concurrently with large Dust Bowl migrations to California and other points west.

Such an uncommon action for an adult male to perform suggests the motivation for the name change was equally uncommon. Performers and movie stars were known to acquire stage names that were easy to remember by their fans and afforded them some privacy in their everyday lives. Privacy also figures prominently for authors selecting a nom de plume when publishing controversial thoughts or delving into taboo topics. The same would hold for criminals evading the police and prosecution. Immigrants with hard-to-pronounce names might anglicize their name as a means to better fit into their new surroundings.

None of the above helps to explain John Paulsen's reasons for his name change. He had no invasion of

privacy issues; he was not evading the law and controversies were not following him.

Perhaps you suspect a familial conflict in the Paulsen household precipitated the change. Did he, for example, discover a shameful skeleton in the attic or closet and want to distance himself from any association with it? That happened to Nathaniel Hawthorne as a young man. One of his ancestors, John Hathorne, had been a judge in the Salem witch trials that began in 1692. Nathaniel did not want to be associated with that miscarriage of justice and added a “w” to his own Hathorne birth name, thereby becoming a “Hawthorne."

In Paulsen’s case I could find no skeletons. In fact, both John Edward’s parents and his wife’s parents offered no objection to a name change, as noted in his legal Petition for a Change of Name (Appendix 1).

Identity Confusion?

So what then was John Edward’s motive for the name change? He offered several reasons in the legal Petition which I regard as valid but incomplete. The explanation requires a fuller understanding of his family, his personality, and the zeitgeist.

The Petition for Change of Name offers “identity confusion” as the principal reason for desiring change, but recall his high school accomplishments. His classmates voted him most popular and most talented.

His confidence and assuredness did not desert him at UMN, nor in his interim jobs before he left for MIT.

The “identity confusion” does not apply to John himself but to those around him who either did not know him or did not know how his surname was spelled.

We can agree that identity is established when a unique face is attached to a particular name. But if you work in a Post Office sorting mail how do you direct a piece of mail with a misspelled surname? Is “Paulson” the same person as “Paulsen” You can’t assume that it is.

So imagine John’s irritation when the Washburn High School’s 1930 Yearbook misspelled his name repeatedly. John’s achievements made him a stand-out at his high school yet his identity took a hit because of the misspellings.

Patronymics

All of Scandinavia at the start of the twentieth century utilized patronymic names. In Norway the first (given) name of the father became the first part of the newborn’s surname to which if the gender was male a “sen” (translated as “son” in English) was added as a suffix; if female, a “datter” became the suffix. So for example if Paul Olson was the father, and the baby was a girl, her surname became Paulsdatter, and if a son was born he became a Paulsen. The given (first) name of the infant was often supplied by the given names of the grandparents, for example Ole and Anne, so that a boy baby might be called Ole Paulsen and a girl, Anne Paulsdatter.

You perhaps have realized that such customs would lead to a relatively small pool of names which then got recycled from one generation to another, and were shared by many… in which case Ole Paulsen might be frequently asked, “Hey, Ole Paulsen, which Paulsen are you?”

The uncertainty or confusion led to the custom of a third name being given to the newborn, the name of the farm where the family lived and worked, as owner or tenant farmer. Ole Paulsen became Ole Paulsen Arneklev to more

easily distinguish him from the Ole Paulsen of the Mickelsen farm. No wonder the Norwegian government outlawed patronymics in the early 1920s and required all its citizens to adopt permanent surnames which did not change with each new generation.

Not infrequently immigrants from Scandinavia and elsewhere had their surnames simplified as they entered the country. The pastor of the Linden Lutheran Church during the time that Edwin and Anne Paulson had their ten children (1870s and 1880s) was Rev. L. E. Green, himself a Norwegian immigrant. His name in Norway was Grenhelsrud, which was anglicized to Green upon entering America. The simplification was a common and accepted practice and no stigma was associated with its change, either by the person whose name it was or by those who knew him before the simplification. It was just a new name for a new country and a new life. Typically no legal procedure accompanied the anglicization. It became official by appearing on one's immigration documents.

Norwegian Independence

An additional source of confusion at that time In Norway arose from its official language. Norway gained its independence in 1905 after being ruled by Denmark for about three hundred years and by Sweden for a much briefer period. At that time Norwegians spoke two principal languages. Nynorsk was confined to the Western fjords area but was more authentically Norwegian than the Danish-tainted Bokmål. The difficulty in picking a single official language ultimately was resolved by making both languages official. Take your pick.

Other identity issues were much less controversial. During Danish rule the capital of Norway was called

Christiania but after independence it reverted back in 1924 to its former name of Oslo.

If you are wondering if Norwegian Americans even cared about what was going on in Norway then, there can be no doubt that they did. Ties to one's homeland may be stretched but usually not severed. All emigrants leave carrying their native language and customs with them. In America's Midwest, at least into the 1920s, Norwegian language newspapers were available in Chicago, Madison, Minneapolis, and Decorah, Iowa. What went on in the homeland would certainly be big news in America.

All of this is to say that John Paulsen likely would have known of the identity and name issues in Norway and it may have stimulated name-change thoughts in his own mind as well.

Spelling

Surprisingly the Paulsen family itself had a clear example of identity confusion and this one had nothing to do with the 1930 WHS Yearbook. It had to do with the "correct" spelling of Paulsen that arose in the family's third American generation, of which John's father, Edward, and his nine siblings belonged. Half of them spelled their surname using "sen", the other five used "son."

Did it matter, "e" or "o"? Either way it was spelled, the pronunciation did not change. Yet it mattered. An uncle of John's began homesteading in North Dakota using "sen" but later switched to "son" when he applied for the title five years later. A "cloudy" title could hinder a later sale of the land, should you want to move elsewhere at some point in the future. Which spelling was correct? "Uncle Sam" needed to know in order to sign over ownership title properly.

Strangely, why wouldn't all ten of the siblings spell their name the same way? If you misspelled your brother's or sister's name would that not be cause for an argument? There must have been some lively discussions supported by sibling-rivalry when the clan gathered for holidays or special occasions as to which group used the correct spelling and which did not. A historical perspective might support the "sen" group since in Norway that was how the suffix was spelled. In Sweden where the patronymic naming system also was used, the suffix was spelled "son".

The recognition issues at school and the arguments within the Paulsen clan over the correct spelling might have been sufficient causes to instigate changing one's name, but there are reasons for thinking more is involved in reaching a fuller explanation.

Muriel Anne

The time has arrived to introduce you to John's younger sister, Muriel Anne. She will be contributing to the identity issue in significant ways. Muriel was as attractive as John was handsome. Born in December 1914 she was almost two years younger than him. Her mother, Florence, had three sisters, the youngest named Muriel Anne. That was the name that Florence decided to give to John Edward's sister. With it came the nick-name "Sister."

Florence wrote in her diary that Muriel was bright and more independent than John as a child. One day she got some ice cream on the tip of her nose and was asked why she was trying to remove it with her tongue. She replied, "Because that is what cows do."

In 1927 when she was twelve she experienced her first epileptic seizure. At first the seizures were infrequent and



Muriel Anne Paulsen c. 1936

mild but by the time of John and Helen's May wedding in 1935 they had become more severe and numerous. The most frightening one occurred shortly before the wedding. So although she had her heart set on being a bridesmaid in the ceremony, at the last moment she was not permitted to participate.

Until then Muriel had been "protected" from the truth about her illness in the hope that she might outgrow the epilepsy. She had not been fully informed about its likely incurability. Her most recent seizure, however, had occurred in the presence of two friends, who were horrified, prompting Ed to finally tell her the full truth.

Muriel's reaction was one of increased determination to somehow boost her chances of regaining a more normal life. Yet the way to do so was not at all obvious; essentially nothing was known about epilepsy in those days. We now know there are many different kinds of seizures, each dependent on where in the brain it originates. Yet to this day treatment, prevention and cures remain difficult and elusive; they did not exist in Muriel's day.

What did exist then for epileptics were big doses of ostracism by many who had witnessed a seizure or indirectly had learned of the "demonically possessed" convulsive appearance of an epileptic while undergoing a seizure.

A month or so following her brother's marriage, Muriel informed her parents she was going to try Christian Science in hopes it would help her better control the condition. Then in August her father took Muriel to Cleveland for an operation everyone hoped would alleviate her symptoms. Recovery took longer than expected and appeared not to have helped as two more surgical interventions occurred later that year.

Unfortunately Florence's diary entries about Muriel's condition were terse and uninformative about how her seizures were changing in frequency and severity. But by late 1936 it was clear Muriel's condition was worse. Edward went to New York City to meet with Dr. Ney about a possible surgery for Muriel. In late June of 1937 Ed, Florence and Muriel returned for a two-hour experimental cranioplasty operation in which Muriel's skullcap was elevated.

Any surgery comes with risks for the patient, some expected, some unexpected. In Muriel's case an undetermined post-surgical complication ended her life in the early morning hours that followed. She was 22. The emotional devastation felt by both parents as reflected in Florence's diary entries cannot be overstated.

But Ed, being both parent and physician, understood better than most the dilemma of surgery balanced against the desire to help his daughter regain a sense of normalcy. He shared some of his feelings with a favorite niece after the destructive storms of guilt and blame had subsided a bit (emphasis added):

> She was the most forgiving person in the world. She held no grudges against anybody. She never complained - never wanted to talk about her condition. But she did want to get well, so what could we do but try. Any way,

she lived in a protected world until she passed on… **It was the pity for her that got me…**

The ambiguity of the last sentence was a puzzle for me that took time to appreciate. Edward as a physician sought physical answers to medical questions. Intractable problems such as epilepsy could torment a doctor whose job is to treat and cure. In such a situation pity is a poor substitute for the inability to offer a patient real help. That had to await advances in the knowledge of the disease.

National Epilepsy Institute

As things turned out, there was something "buried" in the Paulsen family history about which nobody outside the immediate family was aware. Once again it was Florence's diary that helped.

In the aftermath of Muriel's death Ed decided that what would help assuage the family's loss and give meaning to her death was to undertake the creation of a National Epilepsy Institute, authorized and funded by the United States Congress. It would be modeled after the recently created National Cancer Institute. Dr. Paulsen was thinking big and bold (Appendix 2).

Ed convinced Minnesota's senior Senator Henrik Shipstead of its merits and wrote a large part of the proposal for such an Institute, providing the medical background to justify its establishment. Prior to the bill's introduction, Ed visited Shipstead in March of 1938 in Washington, DC to go over the proposed legislation with him and plan strategy.

Interestingly Dr. Coffman, former President of UMN, the Mayo brothers of Mayo Clinic fame, and Doctors Lennox and Gibbs of Harvard Medical School and Boston City Hospital all supported the Shipstead legislation, as did

the City of Cambridge, Massachusetts, which passed a resolution in its support. The American branch of the International League Against Epilepsy had its American headquarters in Cambridge.

Senator Shipstead introduced Senate Bill (S. 1557), dated January 1939, on February 23, 1939. But it was not to be. Neither the Bureau of the Budget, the Treasury Department, nor President Roosevelt supported the bill. No money was available. Senate Bill 1557 never got out of Committee for a vote.

You can imagine how Florence and Ed must have felt when they learned of the bill's fate. Ed's two-year effort to create an institute with the resources to coordinate the necessary long-term study of the disease came to naught.

It was bitter medicine at a time when the news from Europe increasingly pointed to the likelihood of another war, and the economy at home was stuck in the doldrums. Several months later in October of 1939, Ed Paulsen, 55, died from a stroke, five weeks after Germany had invaded Poland to start World War II. The dream of an epilepsy institute was buried with Ed as American eyes turned to Europe. Florence would not mention epilepsy related topics as they were taboos in her mind. A Paulsen secret was born—not about Muriel's epilepsy but Ed's bold effort to create a national institute for its study and cure.

Dr. Paulsen's dream of an institute eventually came to fruition under the aegis of the National Institutes of Health's National Institute of Neurological Diseases and Blindness in 1950. The Institute currently operates under the name, The National Institute of Neurological Disorders and Stroke. Permanent cures for epilepsy in general remain elusive.

Resiliency

> Although the world is full of suffering, it is also full of the overcoming of it.
>
> —Helen Keller

Should you be wondering why I bothered to mention Muriel's illness and death in a chapter on the identity of John Paulsen it is because his father in the presence of his son modeled exemplary creative problem-solving behavior. The boldness of Ed's idea for a National Epilepsy Institute was impressive in its vision and ambition. But there was more. John got a lesson in how bitter lemons might be turned into sweet lemonade, had the institute been created. It became a painful yet helpful lesson in resiliency.

He saw his father commit to a new and challenging cause, one much bigger than himself, that would add meaning to Muriel's life and death, while offering hope to many others like Muriel, desperate to improve their lot. In the future Prof. Arnold would recommend to his students and corporate clientele to think big. Find a worthy project, the biggest they could imagine, and problem-solve it into existence, something his father had once attempted.

I believe that Muriel and Dr. Paulsen emboldened John to become even more assertively oriented toward the future. Pity is no answer for those afflicted with incurable disease. Greater knowledge of its etiology would be a better answer. Muriel died in her efforts to better her future. Her father supported her determination. Neither had time for pity.

Timing of the Name Change

Less than three months after Muriel's death in July of 1937, John Paulsen had acquired a new surname, Arnold.

It was legally completed just as John and Helen departed Minneapolis for Cambridge, Massachusetts and MIT.

Two obvious questions now need addressing, the first being why "Arnold" chosen as John's new surname? I can only offer speculation, so long after the fact. My guess is that "Arnold" derived from "Arne," the first-half of "Arneklev," as in "Paul Olsen Arneklev," the family's first pioneer standard-bearer.

John Edward Arnold declared by the name change that he too was a pioneer emigrating to a new world, that of Engineering and invention. It was a new name for a new and purposeful life-to-be.

The second question deals with the timing of the change. It was bold, impulsive, and daring. It was also opportunistic. The timing of the change was impeccable. There would be no need to explain to anyone at MIT why he had changed his surname, as they only knew him as Arnold. Yet from that point on, the name change would always define his life into "pre" and "post" periods, the latter much more self-determined than the former, as "pioneer" joins his identity in a formal way. John had fully and publicly committed to a new direction in his life. He had to have felt responsibility for making it work.

I don't believe it can be disputed that the John Arnold who compressed a five-year master's MIT curriculum into three years was the same person as the John Paulsen who diversely explored the academic and extracurricular terrain at Washburn High School and the University of Minnesota. As a student at MIT Arnold's academic focus was exclusively on engineering. He gave it his all. He had purpose.

I once asked my father why he changed his name. His reply was that his father had thought it a good idea—no further explanation. That befuddled me at the time. However, it is entirely possible that Ed and Florence were already honoring Ed's pioneering grandfather with a nickname that Florence had given Ed.

Whenever I was in Florence's presence she invariably referred to Ed as Paul. I had assumed she picked "Paul" because of Ed's surname, Paulsen, with no thought given to Ed's grandfather. But perhaps that was incorrect. I think it equally possible that "Paul" was chosen because of Ed's grandfather's given name of Paul. If so, Ed certainly would have approved of John's name-change to Arnold.

Whatever the case, Paul Olsen Arneklev, as the original pioneer of the family, would be an esteemed part of the family and its history and lore. Muriel had joined that tradition when she tried to improve her own future.

In what would appear to be a spur-of-the-moment decision, the attorneys for John Edward Paulsen submitted on Tuesday, September 7, 1937, a Petition for Change of Name to the 4th District Court of Minneapolis. It was granted three days later on Friday, September 10, 1937.

Despite its appearance as spur-of-the-moment, I believe the name change was the result of considerable deliberation over issues already raised in this chapter. Timing the change to just before John and Helen left Minneapolis was ideal in that it sidestepped any awkwardness or controversy that might have been directed at them from the extended family while their presence was still in Minneapolis.

The overnight train to Boston delivered them to the gates of a new world. John entered it as a descendant of

his pioneering great grandfather. With a new name in a new world, John's dominant mindset must have been *Purpose*. He was now planning his own future free of the irritants of past confusions. He was fully committed to making his own mark in a very tough new world.

7: Hobbies

> To develop a complete mind: Study the science of art; Study the art of science. Learn how to see. Realize that everything connects to everything else.
> —Leonardo da Vinci

> What you can't imagine, you can't discover.
> —Albert Einstein

> Happy is the man who can make a living by his hobby.
> —George Bernard Shaw

An under-appreciated aspect of Arnold's identity was his devotion to hobbies, and not just to a single hobby but to a number of them, and not just in a single period of his life but in essentially all of them. Even as an MIT student Arnold found time for some filmmaking. His hobbies were dynamic; they matured as he did, and they became an increasingly valued part of his identity.

Definition

My working definition of a hobby is a self-determined, intrinsically rewarding pastime, one that can be thought of as an end in itself. It need not satisfy anyone else's expectations as long as you find it satisfying. You choose what to do, where to explore, how far to go, when to do it, and how much time, effort, and money to invest.

Hobbies can be a haven from the extrinsically motivated and rewarded behaviors that are usually labeled "work." At the same time hobbies can facilitate the redesign of an "either-or" opposition (work or play) into a "both-and" arrangement (work and play) in which you get

paid to play. The trick would be to convert a means-to-an-end mindset into an end-in-itself, as you discover aspects of the job which satisfy and engage you. An employee who demonstrates self-initiated efforts to excel in his job is likely one the boss will want to retain and promote.

This quick introduction to hobbies is just scratching the surface of what hobbies meant to Arnold. Hobbies were his vehicle for exploring creativity and design. Being creative means in part stretching the boundaries of your imagination in the search of innovative approaches to problem solving and making new connections in your mind.

If you are concerned about looking stupid or silly you will not stray far from what you know to be safe. Hobbies give the luxury and freedom to set aside those fears as you explore. There is no one observing and evaluating your efforts. Make a mistake; who cares? This is the desired ambience that brainstorming attempts to create to facilitate the generation of creative ideas. Hobbyists can do this whenever they want, no group needed.

Hobbies share commonalities as well as differences. For instance, whether working with film or a printing press you may want to improve your skills so as to make a better product. That means one is not only developing technical skills of “doing” (cameras, lights, microphones; presses, typesetting, ink, paper) but also the more reflective and artistic ones of “being” (body language, beauty; formatting that harmonizes and complements the message). Competency requires both.

Another commonality of Arnold’s hobbies is Arnold himself. He remains psychologist, designer, teacher, and consultant. No matter the hobby. His interests in invention and creativity, problem solving and business are involved in each hobby. Growing proficiency in a hobby enhances

self-confidence and esteem, perhaps even boldness and the desire for evermore self-improvement.

Model Railroading

Arnold's model railroading hobby likely arose out of his childhood fascination with the technology as he experienced it in Minneapolis, the transportation hub for the upper midwestern part of the country, which included trains that connected the country from coast to coast. He could well have read about how railroads were built and functioned. The publishing group responsible for the Tom Swift series also published a series on railroading[3].

The great coal-burning steam locomotives of Paulsen's youth had to impress even the most jaded child—so big, so powerful, so loud you could hear from miles away their whistles blowing different pitches coming and going across the prairie. His visits to Turtle Lake and the Lierboe ranch and farm were grand in part because of the overnight train trips. He witnessed firsthand how farmers and ranchers, towns and cities were reciprocally dependent on each other and the railroad.

From a comprehensive design standpoint railroading can be viewed as a complex network of systems and subsystems with the whole helping to support the national economy, perhaps in ways that were not even considered in railroading's earlier formative stage of development. We know that by his high school years that he had sought a

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[3] Railroad Series, by Allen Chapman. *Ralph of the Roundhouse, Bound to Become a Railroad Man,* being the first in the series, 1906. He also wrote a series called *Radio Boys,* another popular topic of the era, c. 1922 ff.

big-picture view of how musical performances, newspapers, and dramatic productions operated.

From a model railroading point of view a comprehensive design mentality might encourage the hobbyist to consider the optimum layout of the train tracks through town, focusing on such things as ease of loading and unloading livestock, hardware supplies, passengers, water and coal for the locomotive, and sidetracks for railcars with freight-car sized loads to distribute. Where would you locate the school, the train station, and the roundhouse to minimize the noise, noxious soot and smoke from the engine, and so on?

The hobby also well may have helped motivate the creation of engineering case studies on boxcar design (1952), growing rice in Burma (Arnold and Ling, undated), and an agricultural tool section in the Arcturus IV case study (Arnold, (1953) 2016). The contributions of America's Midwestern agrarian economy to the nation was in good part due to its immigrants and pioneers, a heritage that John Paulsen learned early on .

Hobby Farming and Construction

The same Midwestern heritage and Arnold's mechanical engineering background likely helped stimulate his hobby farming and the construction of two barns and an atypical ranch-style home on Boston's North Shore suburb of Wenham.

As a young MIT professor in the immediate years following WWII (c. 1946-1950) John built two barns on 28 acres he had bought during the war, a mile from where the family was living. The barns became home to twelve cows and two horses as well as to some pigs and sheep. They also provided storage for hay and farm equipment.

The most unusual feature of the house that Arnold designed and completed by 1949 was a large 44' X 18' workshop that took up most of the space of the basement. (The Portola Valley home near Stanford that he had built when he joined Stanford's faculty also had a large workshop).

Where did Arnold find the energy for all that he accomplished in those days: the erection of barns, a home, and a small guest house? He was commuting 45 minutes each way to and from MIT, teaching a full load, returning home for more work on the farm plus some family time. That's a head-shaker.

He eventually came to this same conclusion and by 1953 the farm no longer had livestock. It freed Arnold for his Creative Engineering Lab work at MIT which by then was attracting national attention.

Filmmaking

If you were an amateur, filmmaking often began with family holidays, birthdays, and vacations. The average home movie was typically not a thing of beauty. Over- and under-exposed film, camera shake and jerky movement, and little to no editing quickly earned the hobby a notorious reputation.

That should not be surprising as the technology itself was difficult for most to master. Darkrooms and expensive equipment were needed to properly develop the film, edit it, and add titles and sound tracks to it. Today all that comes built into a comparatively inexpensive smart phone that has much simpler and more intuitive procedures to aid the novice modern filmmaker…but not in Arnold's day.

The engineer in Arnold was attracted to the technology that Thomas A. Edison helped to develop beginning in the

late 1890s. The performer and the extrovert in Arnold certainly was attracted to filmmaking. The creative stage-acting and management skills he acquired in high school and college could easily make the transition to filmmaking.

In 1939 while still a student who was one year away from his Master's degree at MIT, Arnold demonstrated that he could engineer a very respectable and competent 16 mm short film. It took place in the waiting room of the maternity ward where John awaited the arrival of Helen's and his first-born child, Penny. The expectant father, anticipating he might have a long wait before she arrived, decided to make a film about his experience. The car was loaded with his movie camera and tripod awaiting the harried rush to the hospital. Once in the waiting room he mounted the camera on the stationary tripod so it could record himself pacing back and forth in his role as the concerned husband and expectant father.

An unmanned and unmoving 16 mm movie camera on a normal-height tripod will not capture the wide-angle view needed for a normal looking full perspective of the room. Arnold therefore had to know the bounds of his pacing area. He found they were so restricted that a normal stride was impossible. He was forced to baby-step his way back and forth before the camera—a nice bit of levity at the time. The percent of expectant fathers in 1939 had to have been infinitesimal who decided to film waiting-room nervousness as the mother-to-be was attended to in the delivery room. Yet Arnold did just that, his uncommonness brightly shining.

In 1952 John and Helen took a cruise to Bermuda from New York City. Aboard ship and while touring Bermuda on motor bikes, John did considerable filming. After returning home he edited the film into a twenty-three minute travelog

with titles, voice-over commentary, and music. The elaborate nature of it might make you question why on such a vacation would anyone want to spend so much effort in filming, for example, dinner at the Captain's table with fellow unknown passengers, biking along scenic areas of Bermuda beaches and narrow streets. Why not just soak up the beauty and enjoy the vacation without the effort of filming it?

I would suggest that at least part of the answer rests with the design challenge Arnold assigned himself. Would it even be possible for an amateur to successfully make a travelog while still providing your wife a decent vacation and not irritating a host of fellow travelers in the process? Are you hearing echos of 1939 and *Lucky Penny*?

What would be the minimal amount of equipment needed? What scenes would be essential for the film? Dinner with the ship's Captain and interesting conversations with fellow travelers while eating a delicious meal? Learning how the ship is controlled from the wheel house? Experiencing the way Bermudians chose to live…?

Years later similar filmmaking was reactivated at the start of his sabbatical year from Stanford. Two months plus into touring Europe he had already sent home more than an hour's worth of exposed reels of film for editing.

What is so interesting about Arnold's hobbies is that they seemed to simultaneously serve dual purposes, that is, as both means and ends. They were fun and challenging in their own right, yet at the same time served as means to explore creativity, problem-solving, design, and self-development, areas of knowledge he utilized in the classroom and lab for his students, as well as for his own actualization.

One at times gets the sense that Arnold served as his own experimental subject in efforts to discover more about problem solving and the details of self-actualization. Leonardo had come to epitomize the Renaissance Man; maybe Arnold could rediscover on his own some of what Leonardo learned in developing his own capabilities.

Lastly the hobbies hint that Arnold was already thinking in a broader way about much more comprehensive socio-technical systems, the most difficult part of engineering design because of the human factor. Arnold's interests in farming, pioneering, railroads, and economic development are all seen in the following complex example that developed for the nation to witness during the 1930s.

Mix together farmers, land-use practices, agricultural technology, health, climate, financial profit motives, greed, and transportation infrastructures. Unexpectedly in a real-life experiment, those components combined in a way that produced the giant Southwestern Dust Bowl and a mass migration some estimates put at 2.5 million people. One hundred million acres of Southwestern prairie were stripped of most of their topsoil over an eight to ten year period of drought, very strong wind storms, and inappropriate farming methods.

Although Arnold did not use the Dust Bowl example in his work, he surely understood it as an example of the need for the systemic type of thinking that Buckminster Fuller, also teaching at MIT, was promoting under the name of Comprehensive Anticipatory Design Science.

With a better awareness of what could go wrong when inappropriate farming techniques got entangled with conflicting systems of finance and climate, the disaster might have been mitigated.

The Reality of Ideas and Self-Confidence

We have discussed how Arnold-the-Engineer and Arnold-the-Psychologist might have benefitted from his hobbies. It is time to see what Arnold-the-Professor could gain from his hobbies. Introducing his students to creative problem solving is the obvious thing that comes to mind. Additionally there are two more subtle lessons here. The first is that the intangible world of invention and ideas is a real world. It exists and should be respected. Without it where would inventors be? Neither the Route 128 (I-95) high technology companies around Boston nor Silicon Valley's enterprises would exist if the intangible world was not real. To grow up believing that ideas are but figments of one's imagination is to deny the inner half of your existence, a self-imposed handicap that need not be. Dreams have potency for those who believe they are real. All the commencement recommendations directed at graduates to follow their dreams and make them come true originated with honored speakers who did so in their own lives and knew as a fact the value the advice carried.

The second lesson concerns self-confidence. It is a major ingredient of creative problem solving that is necessary when a good solution to a problem is not imminent. It requires one to accept the challenge "prematurely" before a solution is determined. It requires you to stick your neck out when you know there is a chance you might fail to find a good solution.

What gets you over the initial impasse is your confidence that a better solution exists; you just have to find it. Hobbies are a good way to develop that kind of self-confidence, one reason being your emotional involvement with the hobby and your knowledge that you are following in the steps of more experienced hobbyists who did not

SOMEBODY said that it couldn't be done,
But he with a chuckle replied
That "Maybe it couldn't" but he would be one
Who wouldn't say so till he'd tried.
So he buckled right in with a bit of a grin
On his face. If he worried, he hid it.
He started to sing as he tackled the thing
That couldn't be done. And he did it.

SOMEBODY scoffed, "Oh, you'll never do that,
At least no one ever has done it."
But he took off his coat and he took off his hat
And the first thing he knew he'd begun it.
With the lift of his chin and a bit of a grin
If any doubt rose he forbid it.
He started to sing as he tackled the thing
That couldn't be done, and he did it.

THERE are thousands to tell you it cannot be done,
There are thousands to prophesy failure;
There are thousands to point out to you, one by one,
The dangers that want to assail you,
But just buckle right in with a bit of a grin,
Then take off your coat and go to it.
Just start in to sing as you tackle the thing
That cannot be done, and you'll do it.

"It Couldn't Be Done" c. 1960-1961

quit when they encountered the same or a similar problem.

Edgar Albert Guest, poet and writer/entertainer of the pre- and post-WWI era, captured the mystique of invention and problem-solving confidence with the following poem, which Arnold formatted in his own fashion using Guest's words. It comes from a poetry collection, *The Path to Home*, 1919, and was titled "It Couldn't Be Done." That Arnold was promoting a poem first published in his youth strongly suggests it was a meaningful part of his own development that merited sharing with a younger generation.

A less obvious meaning of the poem is that "the learning is in the doing." With many problems, we will never know ahead of time if they will be solvable by our efforts. We start blindly and slowly move deeper into its issues, our confidence and understanding growing that an acceptable solution may be discovered. Arnold was always a passionate believer in that form of self-instruction. Hope and later success breed determination and confidence and when the next tough problem arises, there is less fear of commitment. A virtuous circle has been created.

Another popular way to build problem-solving self-confidence became a fad in the decade of the 1950s. In 1947 Heathkit began producing high quality kits for assembling electronic audio and video equipment. Little knowledge of electronics was needed. Hobbyists, music lovers and engineers in particular were quickly drawn to the company's kits.

Heathkit also made its kits the basis for vocational classes in electronics. Besides the sound system components, it sold kits of color TVs, electronic test equipment, amateur radios, and even 8-bit entry-level

computers. Their manuals were paragons of clear and easily followed assembly instructions.

Steve Jobs (Morrow, 1995) was a fan of Heathkits:

> It gave a tremendous level of self-confidence, that through exploration and learning one could understand seemingly very complex things in one's environment.

Witnessing your assembled kit perform when it was switched on for the first time became an unforgettable experience for the hobbyist. Obstacles need not be insurmountable. There was no requirement when you started that you had to know the exact route to completion. That would come in the doing. Confidence bolstered determination, perhaps even one's cleverness, and shrank the size of obstacles as you developed a remarkable life-long cognitive tool called problem solving that could help you transcend barriers that might stop others.

Enjoyment

All the previous discussion about the various benefits of hobbies has risked losing the forest for the trees—the enjoyment factor of hobbies. It is seen in the continuity of my father's love of music, first developed in his youth, which likely prodded him to get into Hi-Fi kit assembly. He put together a sound system that might fool you into believing there were unseen musicians playing in an adjoining room of the house.

Sometimes he would try to fool guests into thinking a steam locomotive was chugging through the living room, or that a sudden apparent downpour with thunder in the distance signaled it was raining outside and was time to close some parked car windows that had been left open.

At breakfast he might play a John Philip Sousa march or two before departing for work, a great way to get a dose of invigoration with his sunny-side-up eggs.

Dramatics

> Any acting is a stretch of the imagination.…Acting is truth in imaginary circumstances.
>
> —Sam Worthington

> When you show deep empathy toward others, their defensive energy goes down, and positive energy replaces it. That's when you can get more creative in solving problems.
>
> —Stephen Covey

Both public speaking and theatrics involve performing before an audience who choose to attend. To the degree that a performance is judged by the audience to be authentic and credible it will likely be well received. That means your whole deportment will be judged, not just by your words, but your body language as well. You may recall that John Paulsen started performing before an audience in his pre-high school musical recitals, later transitioning in high school to his drum major and theatrical acting roles.

The more adroitly the performer has mastered such skills, the stronger will be the empathic connection between the audience and himself. The actor can tell whether the connection has been made by how many in the audience are nodding their heads, and laughing, booing, or applauding appropriately during the performance. Empathy helps to create rapport and in situations where social problems exist, can facilitate communication and problem solving.

Teachers, for example, are forever being challenged by their struggling students to find the means each may need in order to grasp a new concept or skill. A limited ability to communicate and to understand possible reasons for student difficulties may be the difference between success and failure for student and teacher alike. The same holds for an actor. An effective performer will know how to win his audience to his cause.

Acting is more than just public speaking. Sanford Meisner, an American actor and co-founder of a school of acting that produced a long list of successful actors (Diane Keaton, Grace Kelly, Gregory Peck, Jeff Goldblum, Robert Duvall, Sandra Bullock and others) has pointed out that good acting is something that an actor could learn on his own:

- Actors must really listen—not as an actor, but as yourself. Empathic skills are essential.

- Actors must use their instinct. Trust of self is required. Self-consciousness (awareness of acting) is the death of a good actor. Inner skill in dissolving the barrier between the real and the imaginary are critically important.

- Actors must improvise, be spontaneous. Their emotions must be guided by the imaginary circumstance of the scene. So well-developed imaginations are required as well.

Empathy, inner freedom to explore and discover, and strong imaginations are necessities for the creative actor and the creative problem-solver. Interestingly enough, it wasn't just actors that attended Meiser's school of acting: theatrical directors, writers and teachers also did. Arnold likely would have loved the experience.

Capturing the Ephemeral

There is a shared thread in music, acting, public speaking, photography, filmmaking, and inventing, be they sound waves, light waves, thought waves, or heart beats. Technology captured them all, as unseen or quick as they proved to be. But as Bill Clancey has reminded me, the capturing is only the first part of a two-step process.

The second step is the re-presentation of what you captured after the editing and design of your product, be it a book of photos, a film, speech, or a printed sheet of paper. All were modified by design to reflect your creation —your purpose.

Turing the intangible into the tangible was a journey and activity that occupied Arnold for his entire life. Nowhere did he study it more or capture it better than with his printing efforts. Ideas and sounds and sights became words and images according to his design as produced on a printed page from his press in his basement workshop.

That deserves its own chapter as we take a look at Arnold's favorite hobby of letter-press printing.

8: United Efforts Press

What gunpowder did for war the printing press has done for the mind. -–Wendell Phillips

Printing…is the preservative of all arts.
–-Isaiah Thomas

Of all the hobbies that Arnold began in his youth and carried into adulthood, it was printing that occupied him the most. For his twelfth birthday his parents had given him a small Kelsey 3 X 5 printing press and a few different fonts of metal type for use in printing business cards, stationery, note pads, announcements, and other assorted small items.

The Kelsey served as his introduction to entrepreneurism. Tom Swift was a fictional inventor/entrepreneur, just as Ben Franklin and Thomas A. Edison became real-life icons of inventive business success. Both could take ideas, existing only in the abstract, and convert them into tangible products that filled real needs for people in ways that were clearly better than what had preceded them.

For example the electricity to illuminate incandescent light bulbs was vastly preferred to candle light or oil fueled lanterns.The ability to throw a switch to start an electric motor suddenly freed up the locations of factories to many more places than just rivers. The new technology created jobs and an expanding economy.

Telephones and radios spread news and entertainment with broadcast speeds that exceeded anything a car, train, or plane could produce, and effectively shrank some of America's vastness.

Similar "magical" achievements in audio recording, photography, and filmmaking made it rather easy to believe that we were entering an era in which just about anything was possible if enough American ingenuity was devoted to it. It was a great time to be alive. Opportunities abounded.

These events were merely a continuation of processes people had relied on in their advancement from hunter gatherers to farmers to mass producers of the products and systems that have enabled our current civilization.

With his Kelsey press Arnold would start participating in the same process that ultimately would lead him to a full professorship at the Stanford Graduate School of Business to accompany his Mechanical Engineering appointment.

Yet it was a first and relatively mild heart attack and the need to moderate his level of stress that opened Arnold's eyes to a new and much larger world that he called The Art of Printing. Prior to this insight he had used his home printing press for both personal and professional needs but in journeyman fashion. Arnold viewed it as amateurish work produced by a dilettante (Appendix 5). Examples would include personalized stationery, note pads, and Christmas cards. Academic applications at MIT included Arcturus IV's cover and all its forms, stationery, tables, and so on—all produced in his Massachusetts' home basement. Similar efforts were observed in his early years in California.

A heart attack can prompt a reassessment of how one spends whatever time remains in as meaningful a way as

possible. I think that was when Arnold discovered that hobby printing could be so much more beneficial to his life than it had been. Proficiency in a complex skill like printing would serve both his self-actualization and his creative interests at the same time. It is to these efforts that this chapter is devoted.

The two hobby printer associations that Arnold joined at the inception of this highly productive period of printing (1960–1963) were the Amalgamated Printers Association in 1960 and the Companions of the Moxon Chappel in 1961.

Amalgamated Printers Association (APA)

The APA was just two years old when Arnold joined it. Arnold had traditionally found his workshop time relaxing so perhaps he was thinking he could kill two birds with one stone: follow doctor's orders while having fun with printing projects.

He and the President of the APA came up with an idea for some contests for its 150 members, the purpose being to advance their design and printing skills in typesetting contests judged not on the text per se, but on the means used to complement text with font, ink, paper, and dingbats. Design was the focal point of the APA contests.

I think both Arnold and the President expected that with a little encouragement and over time a growing number of members would participate in the contests and discover the fun of creative design challenges as they improved their skills.

For whatever reasons those expectations were not realized after a two-year effort, and the contests ended in disappointment and a bit of exasperation. The huge success of the Arcturus IV case study experiment at MIT

seven years prior was not replicated with the APA members. The effort did reveal that Arnold was still searching for good ways to teach creative design.

I think it was also a preliminary attempt to assess if members were eager to improve their printing skills. Could any evidence be spotted that suggested members were finding the effort fun as they becoming more competent? Arnold was disappointed and surprised by the lack of evidence. He personally felt a strong urge to improve his skills. He assumed most others would too. The results highlighted his own uncommonness.

But results aside, the APA effort was clear evidence of how a hobby could be usefully employed in investigating creative design work. Simultaneously Arnold continued his own personal development as he began the notoriously difficult skill of photo engraving.

Newspapers

The Friendly Typographical Reunion that Arnold created for his APA identity illustrates his fondness of the newspaper format of high school years By now it should be apparent that there was nothing casual in Arnold's new approach to printing. He saw it as an art form, a medium highly malleable by expert typesetters and printers who appreciated the power of design in bringing ideas into tangible reality by using layout design skills, fonts, colored inks, illustrations, and type of paper. It was an interest that had begun in his pre-high school days. In Vol. 1 No. 1 Arnold reveals how his hobby began.

From Arnold's perspective as a psychologist/engineer/printer/educator he was comprehensively involved in the elaborate process of idea generation, transformation, and propagation. Newspapers are a well suited medium to



Vol. I No. 1 *Portola Valley, Calif.* March 1960

New Member No. 158 Tells All

All? Not quite, for a man must keep some secrets or give lie to the reputation that he has so carefully built up over the years. Yet, a certain amount of biographical data seems to be in order if I am to judge by the contents of the first "mailing" that I have received and believe the letters that I have already received from some of my new friends in APA.

It is a strange coincidence that as I write this I am about to celebrate a birthday uncomfortably close to the mid-century mark and realize that on a similar birthday 35 years ago I got my first taste of Printing as a hobby. I don't know what first drew me to printing for the Kelsey ads in Popular Science of 1925 were no more provacative than they are today. But somehow I saw the ad and sent for their catalog. When it arrived, I avidly read and reread it many times. There was little choice in the size of outfit (that had been established by decree) but I did have my choice of three small fonts of type and some paper. Those were mighty important decisions and could not be made hastily.

The outfit did arrive safely and on time for my birthday. With but a very few exceptions, printing has been one of my hobbies ever since. This birthday, I think that my wife is planning to "surprise" me with some new

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Amsterdam-Continental faces to fill the empty cases that I just happen to have on hand.

The Kelsey 3 X 5 eventually gave way to a Pilot, which has, in turn, been replaced by a 10 X 15 Golding. I think my press must be about a 1905 model (the motor is a museum piece) but it had been carefully reconditioned and runs beautifully. This is probably my "next-to-the-last" press for maybe someday I can trade it in on a new C & P or Heidelberg.

Now, what about me? My name is John E. Arnold and I am a Professor of Mechanical Engineering at Stanford University in Palo Alto, California. I have been here just three years. The previous 20 years were spent in New England, most of them on the Faculty of MIT. At Stanford I head-up the program in Comprehensive Design. We are concerned with the design of products, machines and systems, which, I guess, encompasses about everything made by man. Just to make things interesting, I am also on the faculty of Stanford's Graduate School of Business where I teach courses on management of research and development. This dual responsibility makes life very hectic at times during the school year so it may well be that my contributions to the "bundles" will have to be made during the summer months --- that is if I can tear myself away from another of my hobbies, gardening.



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One of my main interests in education has been a deep concern with the recognition and development of creative ability in young engineers and scientists. I started the first Creative Engineering Laboratory many years ago at MIT and have continued research in this field ever since. I mention this because I want to encourage all the younger members of APA to keep up their interest in printing and practice it as much as possible. I am sure that it is an excellent vehicle for exercising creative talent and I know what I'm talking about. It is not just coincidental that Benjamin Franklin was a printer.

A potential for creative behavior is inherent in all of us to one degree or another, but at best it is weak and fleeting and must be exercised constantly if it is to grow and strengthen. Our society needs all the creative people it can develop. Printing provides ample challenge to one's creative imagination and an unlimited opportunity for practice. All the elements of the visual arts are found in various amounts in Printing. Line, mass, shape, color, texture, etc. can be combined and recombined in an infinite number of ways, all easily under the control of the printer, some of which may be works of art, truly creative.

So much for the brief history and lecture. The future should be quite an exciting time, for the exchange of ideas and creative products with other printers is something I've wanted for a long time.



FTR I, 1, p.3, 1960

exercise and develop these skills, as Ben Franklin demonstrated time and again.

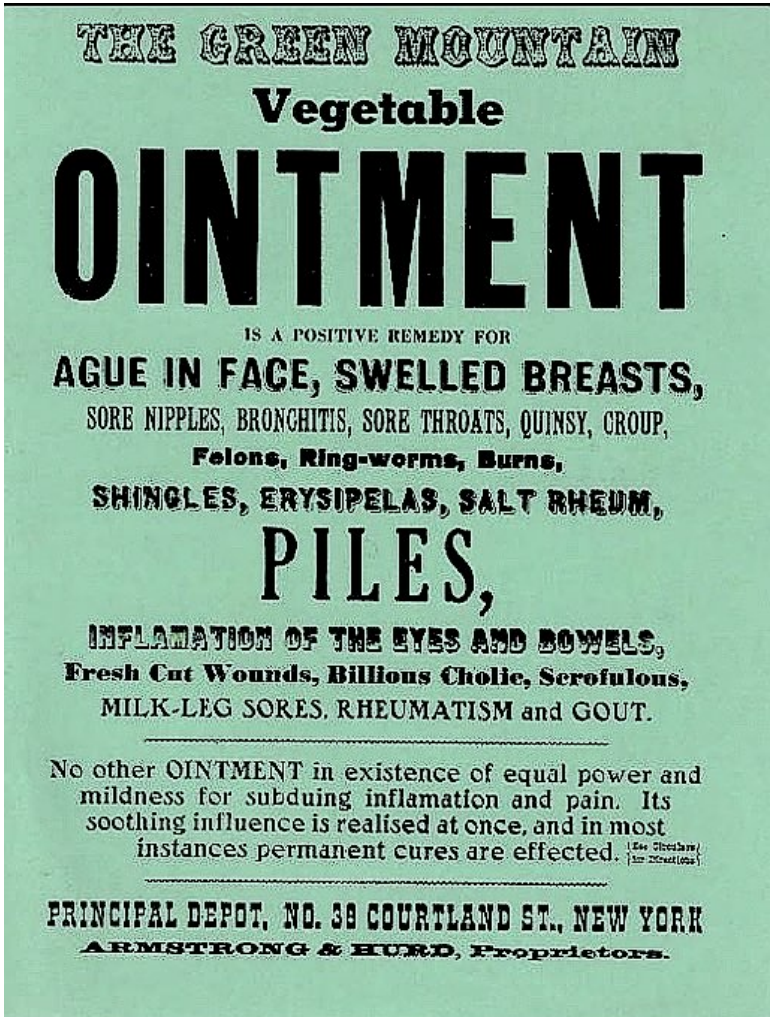
For three years Arnold submitted three or four Friendly Typographical Reunion issues per year to the APA and ran the contests for two years with about the same frequency. He set new standards for what it meant to be an active member. In subsequent sections I illustrate Arnold's ability to design posters that attract and inform readers, followed by a magazine article he wrote and typeset, a complex design incorporating aspects of all the formats that he explored.

Posters

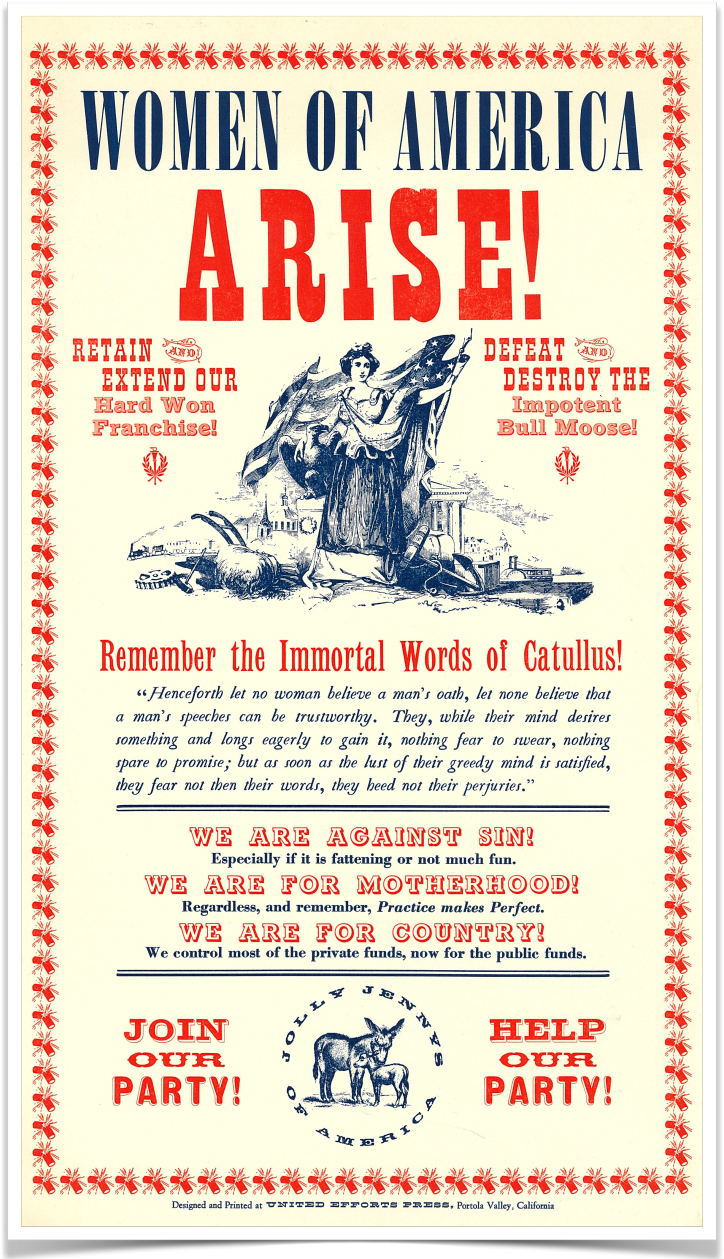
This medium has a power all its own, and the typesetters of the nineteenth century created a format that Arnold found very entertaining in the way it could grab the attention of a passerby.

Here is a poster advertising a "medicinal" ointment that Arnold reduced to the size of a label and stuck on a bottle of Jack Daniels sour mash whiskey for his own purposes, curious if it might tempt guests to try it.

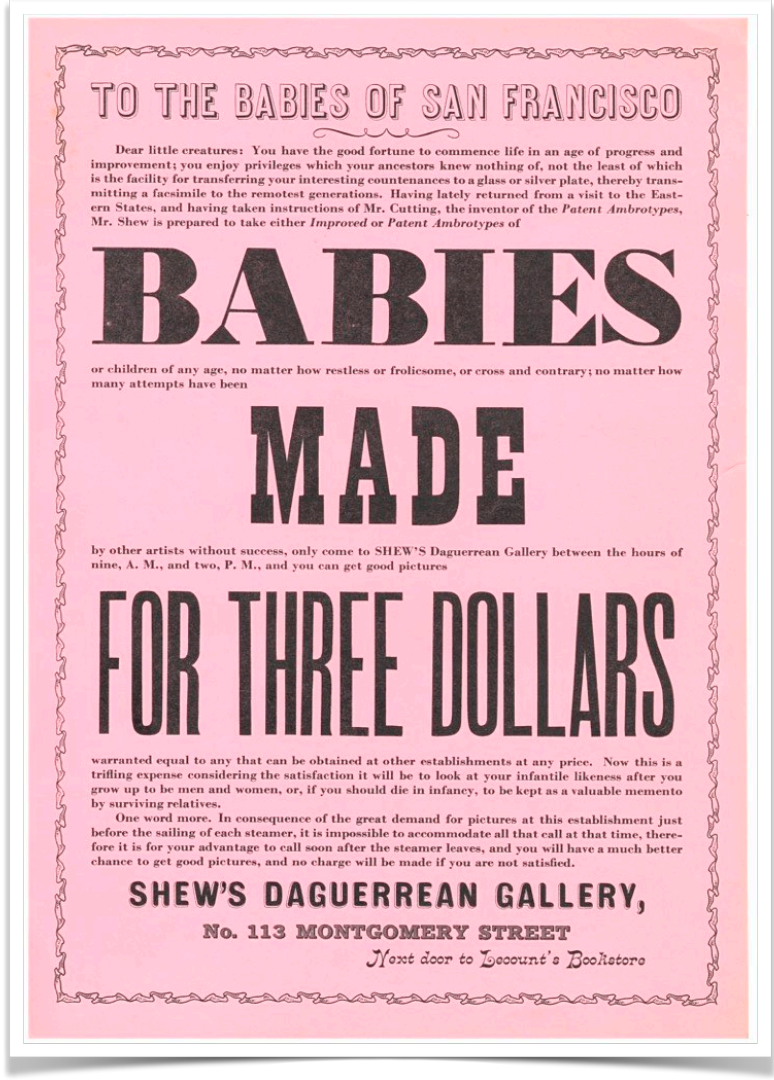
Humor was often an important ingredient of a poster, and knowing Arnold's love of wit and performing before an audience, you can understand the dramatics incorporated into the posters. Indeed some of the posters seem to be beckoning the reader as if they were somewhat animate themselves.



Repurposed as Whiskey Bottle Label c. 1962



A political motivator, c. 1960-1963



TO THE BABIES OF SAN FRANCISCO

Dear little creatures: You have the good fortune to commence life in an age of progress and improvement; you enjoy privileges which your ancestors knew nothing of, not the least of which is the facility for transferring your interesting countenances to a glass or silver plate, thereby transmitting a facsimile to the remotest generations. Having lately returned from a visit to the Eastern States, and having taken instructions of Mr. Cutting, the inventor of the *Patent Ambrotypes*, Mr. Shew is prepared to take either *Improved* or *Patent Ambrotypes* of

BABIES

or children of any age, no matter how restless or frolicsome, or cross and contrary; no matter how many attempts have been

MADE

by other artists without success, only come to SHEW'S Daguerrean Gallery between the hours of nine, A. M., and two, P. M., and you can get good pictures

FOR THREE DOLLARS

warranted equal to any that can be obtained at other establishments at any price. Now this is a trifling expense considering the satisfaction it will be to look at your infantile likeness after you grow up to be men and women, or, if you should die in infancy, to be kept as a valuable memento by surviving relatives.

One word more. In consequence of the great demand for pictures at this establishment just before the sailing of each steamer, it is impossible to accommodate all that call at that time, therefore it is for your advantage to call soon after the steamer leaves, and you will have a much better chance to get good pictures, and no charge will be made if you are not satisfied.

SHEW'S DAGUERREAN GALLERY,

No. 113 MONTGOMERY STREET

Next door to Lecount's Bookstore

A poster cannot move or talk, yet it still knows how to get your
⇨ **attention** ⇦
c. 1960-1963

Magazines

Arnold did not use the magazine format often, likely because of the number of pages a magazine typically carries. It is a lot of work—typesetting, images, the copy—and a creative design challenge. Yet "Work & Win," presented next in its twelve-page entirety, is a masterpiece that stuns with its cleverness and wit. It is a parody of the Tom Swift series that the Edward Stratemeyer Syndicate developed under the nom de plume of Victor Appleton. You will see Arnold's characters speaking in a highly similar fashion to Appleton's characters such as Wakefield Damon, who frequently would utter idiosyncrasies such as "Bless my brakeshoes" and "Bless my vest buttons."

The title, "Work & Win," matches the philosophy of Arnold and Tom Swift, both of whom thought inventive work was fun and rewarding. They enjoyed applying their intelligence to solve mysteries while inventing better means to do so which then often became a business opportunity once the adventure had ended. Formal education was not a prerequisite for success. Swift's education ended with a high school diploma, while Arnold had a Bachelor's degree in psychology and a Master of Science degree in Mechanical Engineering; obviously self-education continued unabated for both.

"Work & Win" is a metaphor of Arnold's life and philosophy, his humor and sociability, his creative blending of youth and maturity, his playfulness, and his unending effort to develop more of his own abilities as he spread the word of creative design in the service of mankind.

continued on 111



Work & Win

An Interesting Weekly For Young America

Issued Weekly By subscription, $2.50 *Entered as Very Low Class Matter Everywhere*

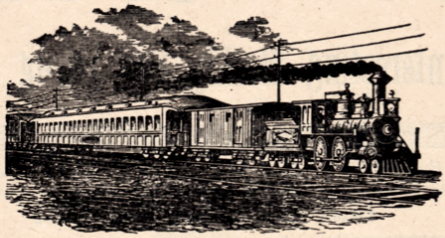
NO. 376 Portola Valley, California, March 31, 1902 Price 5 Cents

TOM SWIFT and his MAGIC COMPOSING MACHINE

A Tale of Mystery and Excitement by
Arnold E. Johns

Work & Win, p. 1, 1962

BOYS! Win this Electric Train FREE!

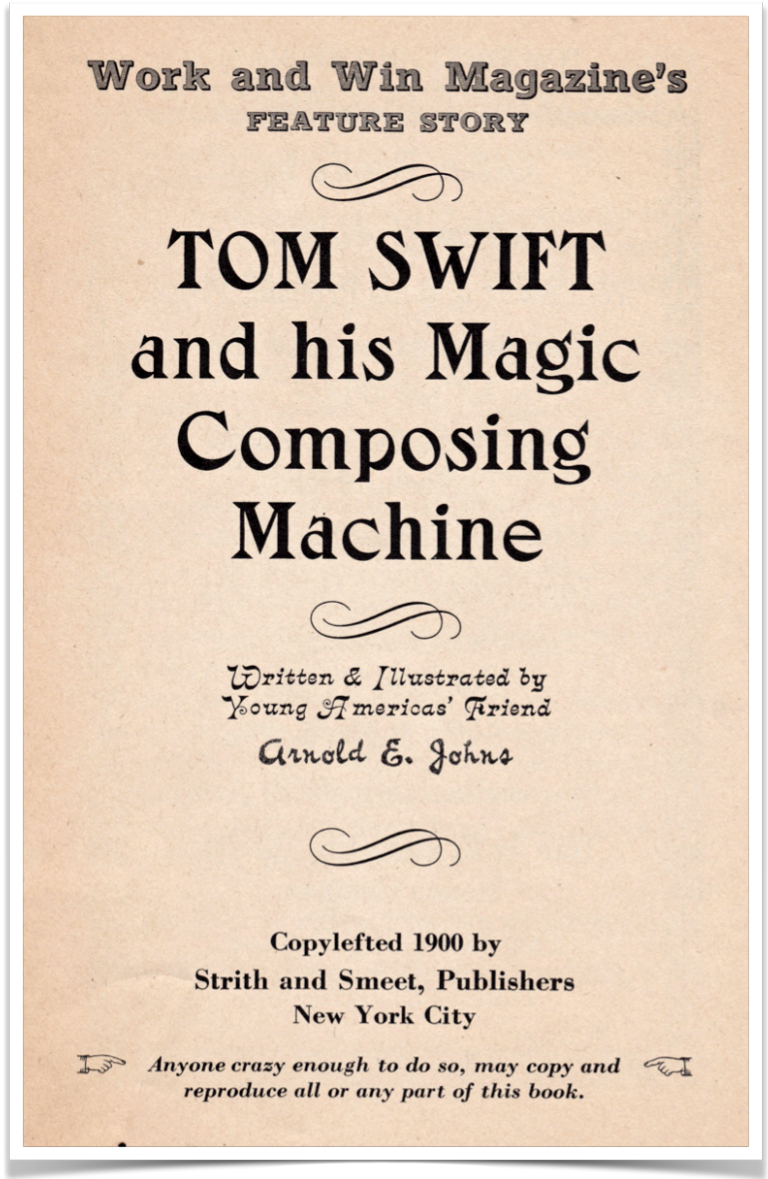


All you must do is sell 1000 sets of our beautiful FRENCH POSTAL CARDS. Everyone you meet is a potential CUSTOMER, especially the young unmarried DANDIES. Each set consists of TEN lithographs in FULL COLOR of the gorgeous FOLLIES GIRLS, just as they appear on the FRENCH STAGE. Just send us $1000 plus a few cents postage, and we send YOU this 50 Piece Train Set absolutely FREE and 1000 sets of cards (each set wrapped in a plain envelope) Sell the CARDS for only $1.00 a set and you'll soon have your money back. BOYS! Here is a fine chance to WORK and WIN.

Write to **Fagin McGurk,**
Alcatraz Island Resort, California

Enclosed please find Postal Money Order for $1000. Please RUSH my 50 piece ELECTRIC Train Set and FRENCH Post Cards.
Name..... Date.....
Street Address.....
City & State.....
Age..... Sex..... Next of kin.....

Work & Win, p. 2



Work and Win Magazine's
FEATURE STORY

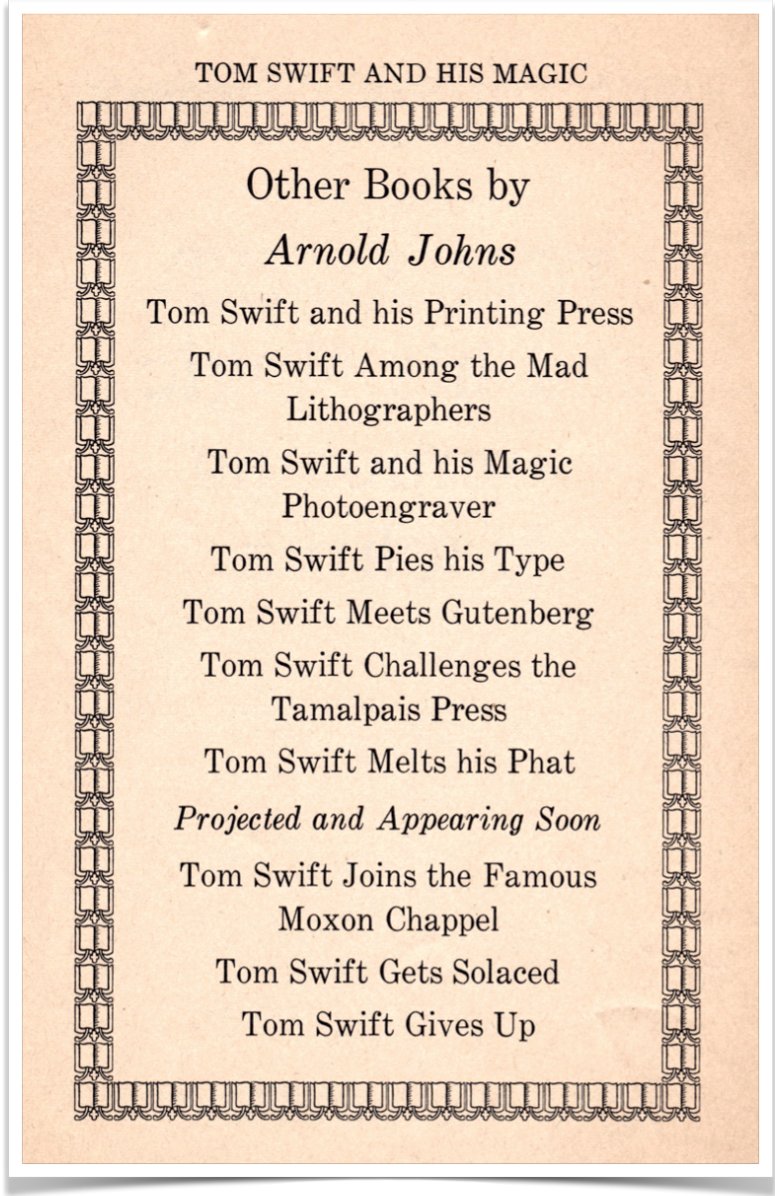
TOM SWIFT and his Magic Composing Machine

Written & Illustrated by
Young Americas' Friend
Arnold E. Johns

Copylefted 1900 by
Strith and Smeet, Publishers
New York City

Anyone crazy enough to do so, may copy and reproduce all or any part of this book.

Work & Win, p. 3


TOM SWIFT AND HIS MAGIC

Other Books by

Arnold Johns

Tom Swift and his Printing Press

Tom Swift Among the Mad Lithographers

Tom Swift and his Magic Photoengraver

Tom Swift Pies his Type

Tom Swift Meets Gutenberg

Tom Swift Challenges the Tamalpais Press

Tom Swift Melts his Phat

Projected and Appearing Soon

Tom Swift Joins the Famous Moxon Chappel

Tom Swift Gets Solaced

Tom Swift Gives Up

Work & Win, p.4

COMPOSING MACHINE

Synopsis of Previous Chapters

Tom Swift, the brilliant young inventor, and his jovial and equally brilliant young friend, Paul Quyle, have been working secretly in Paul's clay pit in the foothills of the Sierras on an astounding new invention that Tom and Paul believe will revolutionize printing. It is a magic composing machine, and as the story unfolds, we get some glimpse of the unusual specifications. Following the lead of an equally brilliant old inventor, Pi Ching, they are using hollow movable ceramic type, assembled by a magic flotation process, utilizing a variety of fluids having different specific gravities. All has been going well to date with the exception of the fluids that handle the vowels. Each night, lately, regardless of how carefully they guard the clay pit, someone comes in and tampers with the vowel jugs, so that when an *a* is called for, a *sometimes y* is set instead. They are not sure who is behind this exasperating set of circumstances, but they suspect a mysterious stranger with a flowing black moustache and a brilliantly brocaded vest, by the name of Dan X. Solo, who would like to pilfer the new machine away from Tom. It is further suspected that Dangerous Dan is in the employ of an unscrupulous publishing firm called the Sunset Company.

Tom and Paul, in an attempt to solve the baffling mystery of the mixed up vowel jugs, decide to attend a meeting of the famous Moxon Chappel, a group of dedicated and skilled devotees of the graphic arts. The night they chose for their visit was, unknowingly, well timed, for the Moxon Chappel was meeting in Sonora to pay homage to Pi Ching on the anniversary of his birth. *Now go on with the story.*

Work & Win, p. 5

Chapter XVI

But there was an ominous feeling in the air as Tom and his young friend Paul sat down to the sumptuous Chinese feast that had been prepared for this seemingly jolly group at the little Chinese Tea Room and Brothel known as the Wagon Wheel.

"Maybe it was too jolly," Tom contemplated silently to himself as he quickly recalled the welcomes that he and Paul had received when they made their entrance just a few minutes earlier.

"Well, bless my short stop bath," chortled the eccentric Father of the Chappel, who was also a photographer of note, "if it isn't our two brilliant guests."

"Buenas Dias," mumbled the wirey Companion from Los Gatos as he attempted to greet them in Mandarin Chinese.

"Welcome, ingenious youthful inventors!" shouted the assembled Companions, official and sex-officio. The shout was necessary for at that moment one of Tom's earlier inventions, the magic Talking Machine (see his book 26), blasted away in a cacophony of ear splitting sounds, and a group of natives started a series of wild gyrations known as the twist.

But Tom's nervous reverie was short lived and his normally alert mind snapped to attention, for who was walking into the room but the mysterious stranger with

Work & Win, p. 6

the flowing black moustache, Dan X. Solo.

Tom and Paul quickly exchanged knowing glances, as if to say, "Be on your guard, friend, the enemy is here, and this jovial banter is a flimsy sham."

Later, by a series of clever manuvers, Tom and Paul found themselves alone in the Men's Room. Tom spoke first.

"We must watch this man Solo carefully, I think that he knows more than he has admitted so far." As usual, Tom was right in his prophetic pronouncements, for later that evening, Dangerous Dan talked, and talked, and talked. But we are getting ahead of our story.

"Yes, Tom," rejoined Paul, "and, moreover, did you realize that Companion Pfeiffer is none other than the VP of Sunset Publications?"

"Gracious Heavens, No!" exclaimed Tom. "We certainly are in a pretty kettle of fish, and we must tread carefully, or we'll all hang separately," he continued, mixing a few metaphors.

"Do you suppose that we can count on the other two Companions, McKenney and Arnold?" asked Paul.

"We must watch and see," replied Tom, and I hope so, for they seem to be charming fellows."

"Yes they do," admitted Paul, "and Arnold seems to be almost as brilliant as we."

"But with an air of true humility that we sometimes lack." countered Tom.

Later at the meeting, the spirit of gay abandon rose to an all time high and Tokens were handed out almost indiscriminately during Mechanick Exercises.

Work & Win, p. 7

"Bless my pica rule," quoth the Dear Father as he was awarded a token for his invitation.

"Bless my linotype." sneered Companion Kane as he accepted two tokens for his hand-set(?) project.

"Bless my humble spirit," murmured Companion Arnold as he hesitantly accepted two tokens for two very well executed 19th Century posters.

Even Paul Quyle, Tom's young friend, was awarded a token for a well designed and printed broadside, containing a zinc etching of his own manufacture.

Companion McKenney presented proofs of a forthcoming book and Companion Pfeiffer proved the suspicion that Tom and Paul had previously tendered, by giving all the sex-officio Companions copies of the new Sunset Cook Book. He was apparently using this act as a nefarious way of writing mash notes to all the wives present.

Tokens were also awarded to the Blake Press for Valentines received, to Dear Father for his minutes of a previous gathering, and to the Meridian Press in Karachi for detailed information about the FAACMC.

And then the villian with the black moustache talked. In his sonorous voice he displayed a knowledge of type casting and composition that had obviously been gained from wide personal experience and hiding in Paul's clay pit. The young boys' earlier suspicion that Dan was somehow involved with the vowel jugs was confirmed when Dan inadvertently described a type distributing system he had seen operating on the same principle as Tom's composing machine.

Work & Win, p. 8

"Bless my pied type," exclaimed Companion Pfeiffer, "but I would like to have such a machine in my publishing plant."

Dan's talk was momentarily interrupted by someone reading off a list of Tokens and Solaces earned by the Companions during the past year. Someone was fined one dollar for lack of humility.

Then, as if a bolt of lightening had struck, the eccentric Dear Father querried, "Bless my 5 x 8 Kelsey, but where is Companion Osborne tonight?"

And just as suddenly, Tom and Paul realized why they had continued to have a feeling of impending danger in spite of the frivolous spirit of the evening. They had tried to ease their troubled spirits, as had everyone else, with copious quantities of the fermented juices of various grains, and with the knowledge that while Dan and George could be seen they could not be mixing up the vowel jugs.

But now, what calamity is this? A Companion missing, and none other than Libel Lew of Sunset. Undoubtedly he was, at this very moment, rummaging around in Paul's clay pit and making it impossible for them to set on the morrow Pi Ching's famous Farewell, "Pack my box with five dozen jugs . . . . ."

Boys, Don't Miss the Next Chapter!

It's Packed with Excitment!

By Mail Subscription or on All Newspaper Stands

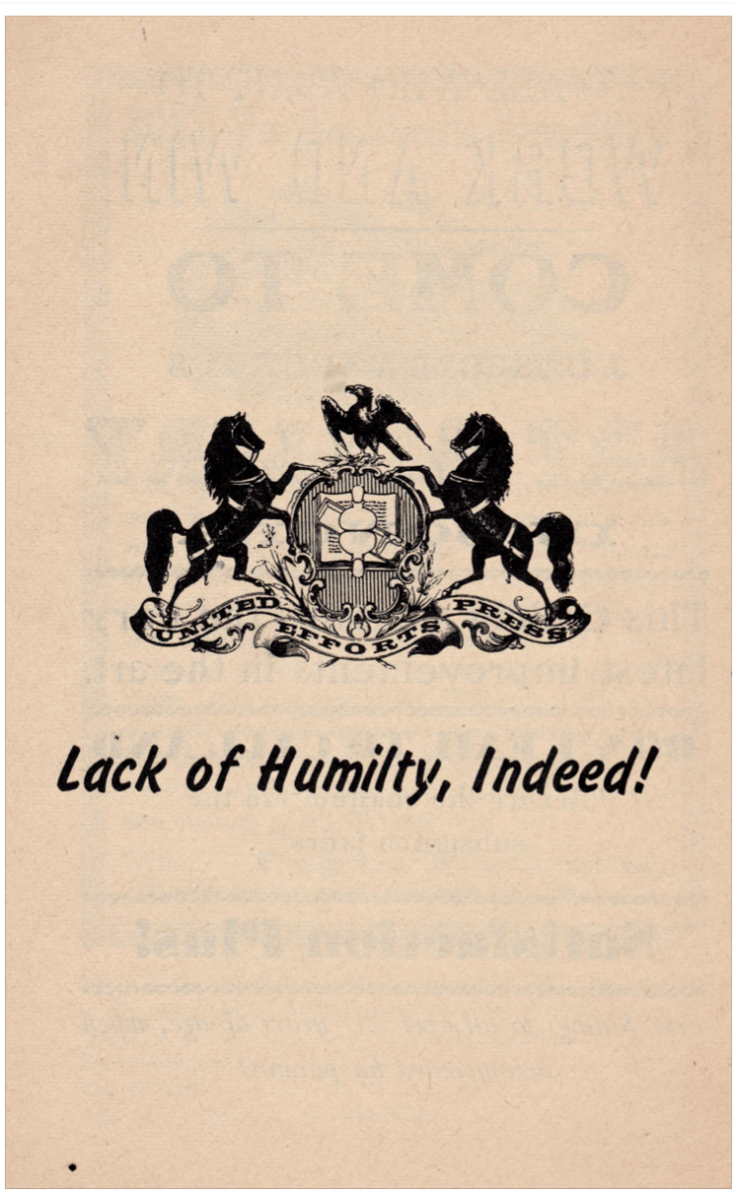
Work & Win, p. 9


LIVE ALLIGATORS
make lovely house pets and playmates for the children. Be the first in your neighborhood to own one. They multiply rapidly, and their hides can be made into charming shoes and socks and underware.
KANE'S PET SHOPPE
PRINT FOR YOURSELF AND OTHERS
Learn and Practice the "Art Preservative." Presses, Types, Inks, Papers, and other Supplies. We are the Exclusive Agents for the new QUYLE CERAMIC TYPE and PORCELAIN FURNITURE. Special Apprentice Courses! Send for FREE catalogue and samples.
WILMAC PRESS
BE THE LIFE OF THE PARTY
You, too, can make the switch from Casper Milquetoast to *Bon Vivant* as we have, Just send for our GIANT FREE Catalogue of hilarious FUN MAKERS: Exploding matches and cigars, Itching Powder, Stink Bombs, and many other laugh producers we all love.
OSBORNE and PFEIFFER, The Happiness Boys

Work & Win, p. 10


TO ALL WHO WANT TO
WORK AND WIN
COME TO
J. CARROLL MAHONEY'S
ART GALLERY
IN SONORA
This Gallery contains the very latest improvements in the art.
DON'T FAIL TO CALL AND
"Secure the shadow ere the substance fades."
Satisfaction Plus!
Free Sittings to all over 80 years of age, when accompanied by parents!

Work & Win, p. 11



Work & Win, p. 12

Arnold created “Work & Win” for the other hobbyist group of printers that he joined in 1961, the Companions of the Moxon Chappel. Full appreciation of “Work & Win” would require knowing the Moxon members and being familiar with the different aspects of printing. Even so, it is fun to see how accessible it is to the rest of us.

The featured magic composing machine (pp. 3, 5) is the only machine I know of that Arnold personally engineered…but what an awe-inspiring creation it was. It mimics the human mind—hollow ceramic cubes circulating about as they float in fluids until self-assembling into meaningful larger units. Isn’t that like the creative processes assumed to be active in our subconscious minds?

The other books that were listed in Arnold’s version of the Swift series (p. 4)—such as meeting Gutenberg, pieing (making a mess of) a large amount of assembled type, challenging a Moxon member (the Tamalpais Press)) and, heresy of heresies, “Tom Swift Gives Up”—showed lots of cleverness and humor.

At the same time there was unexpected depth in the content. For example, Companion Mahoney, a professional photographer, is spotlighted on page 11. The advertising slogan, “Secure the shadow ere the substance fades,” refers to the real-life nineteenth century practice of photographing a loved one just before or just after having passed on. Arnold must have overheard Mahoney mentioning it during a Moxon get-together or perhaps seen the slogan in his research of the era.

On page 12 Arnold displayed a new logo for his United Efforts Press with a rather pretentious equine feeling to it. He then intentionally misspelled humility. He wins a last laugh.

On the serious side, the head of the Moxon Chappel, Dear Father, at each meeting could dispense fines (solaces) to any member he judged merited one. Arnold had been fined in the previous meeting for a poster he submitted, as well as perhaps for the new logo. The contrast is striking when compared to the old one:



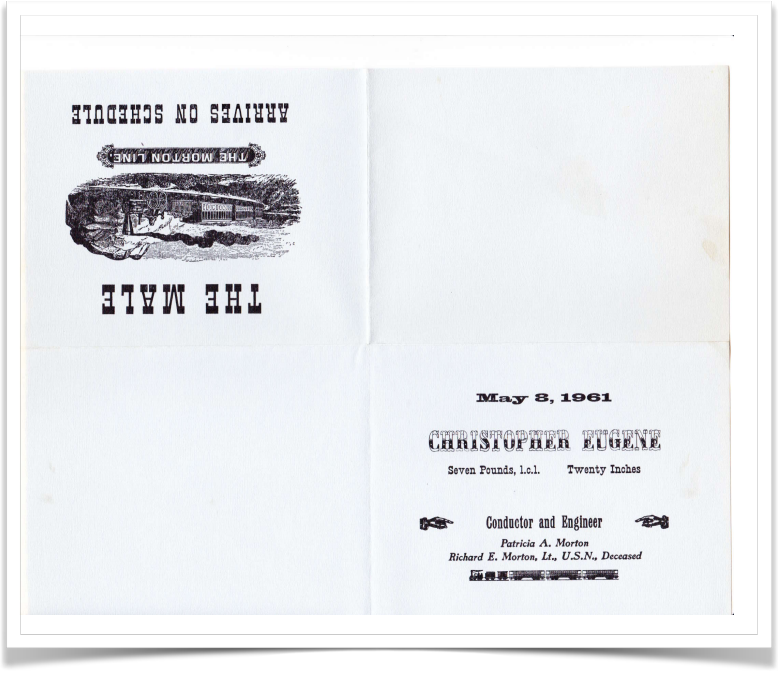
The Original Logo of United Efforts Press c. 1945-1950

On a more abstract level you can read into the old logo of tug-of-war an “either-or” opposition, whereas the new logo employs two cooperative (and haughty?) horses, a “both-and” transformation of an “either-or” dichotomy.

The masterpiece quality of “Work & Win' is anything but humble. It is breathtaking…something any craftsman would take pride in. That Arnold wrapped his performance with humor helped lighten the presentation. The “humble” one disarmed his companions with his humor as he showcased his proficiency.

Other Notable Efforts

The first is a birth announcement of his only grandchild to have been born while Arnold was alive. It was literally and figuratively a creative moment for all and worth the reader's careful inspection.



The unfolded manner of printing two pages simultaneously.
1961

The Sermon on the Mount. The year 1961 was a troubling one for international relations. In July President Kennedy urged Americans, if able, to build fallout shelters to protect themselves from the radioactive dust and debris that would follow nuclear warfare. In August the Berlin Wall was erected by East Germany in an effort to stop its citizens from escaping to the West. In October the USSR detonated a 58 megaton hydrogen bomb, the largest ever, in the atmosphere over Novaya Zemlya.

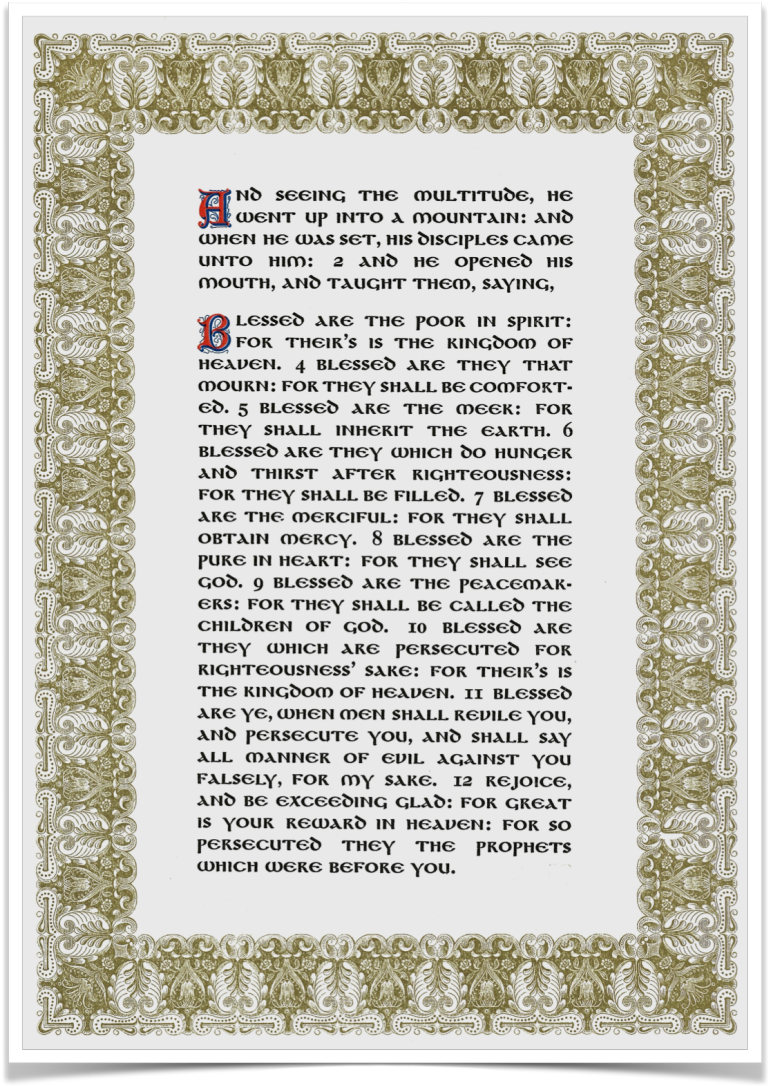
In the last quarter of 1961 the Arnolds installed a fallout shelter in the ground of their Portola Valley lot. That Christmas John distributed fifty copies of the Sermon on the Mount to close family, friends, and relatives. It was an elaborate effort of seventeen pages which required four inks of different colors on custom paper. That is, each page required four perfectly aligned impressions from the press as a different colored ink was added to the page.

Why the "Sermon on the Mount"? Perhaps because Arnold regarded Christ as a great teacher who reinterpreted the traditional commandments in a new fashion for his followers: They were to obey and apply Jesus' teachings, wherein the ten commandments of Moses were condensed into Jesus' two all-encompassing and non-oppositional commandments.

I can recall my father reciting more than once that a prophet is without honor in his own land. But there was always a twinkle in his eye when he said it. It reminds me of Einstein's formula: S = W + P + QT, where S = success, W = hard work, P = lots of play time, and QT = keeping your mouth shut![4]

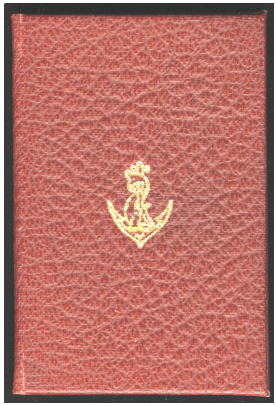
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[4] First reported in the New York Times Magazine from an Einstein interview in August of 1929 as A=X+Y+Z. "A" meant success in life, "X" being work, "Y "stood for play, and "Z" meant keeping your mouth shut.

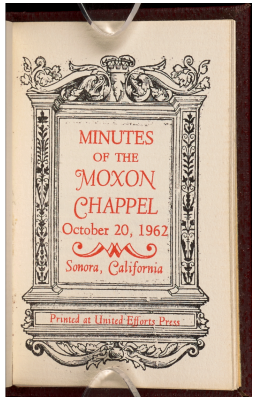


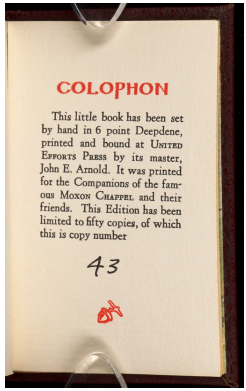
An excerpt from The Sermon on the Mount
1961

Miniature Book. When it became Arnold's turn to write the Moxon meeting minutes, he decided to do so in the form of a miniature book, as he had never tried that format nor had any other member. Its exact dimensions could not be determined. Based on scans from the University of Virginia Library's copy, it was certainly small, perhaps 1" x 2", its cover leather bound.









Moxon Meeting Minutes
in miniature
1962

9: Conclusions—Uncommon Man?

> It's a helluva start, being able to recognize what makes you happy. —Lucille Ball
>
> In any free society, the conflict between social conformity and individual liberty is permanent, unresolvable, and necessary. —Kathleen Norris
>
> How will he who does not know how to govern himself know how to govern others? —Miguel de Cervantes

The time has arrived for the reader to assess the validity of the biography's title. Was my father an uncommon man? Does his life story still remain unfinished sixty years after his death? Should you even care? Did I waste your time and my own? Let us hope not for both our sakes…

Yes, John Arnold was uncommon. His Stanford colleagues thought so as well (Appendix 4). They noted that he led by example and not by command. He had an exceptional mind and well-developed creative abilities. His inventiveness was not directed at engineering's traditional machinery and systems but rather at designing better problem-solvers. To that end he invented the Creative Engineering Lab at MIT and the Design Division[5] of Mechanical Engineering at Stanford. He also invented a significant degree of himself.

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[5] Initially Arnold referred to the Division as "Comprehensive Design" but later dropped "Comprehensive" from the title in an inclusive design gesture to all.

Those inventions qualified him as an uncommon teacher, psychologist, and engineer. He thought that individuals would choose to develop their potentials if given the opportunity, and he himself became his own best experimental subject in testing that hypothesis. He felt rewarded by his actualizing efforts and was surprised when others were not as motivated as he, a clear sign of his uncommonness.

His fascination with curiosity, the imagination, and creativity, and his playfulness, wit and extroversion, became the springboard for his explorations into music and dramatics, printing, psychology, invention, teaching, and a variety of hobbies. He showed uncommonness in each of these areas.

His knowledge of who he was—his identity, his energy and passions, his integrations within his identity, within his cognitions—was uncommon.

Uncommon Boldness

So far I have not discussed Arnold's boldness of thought. Certainly bringing creativity and science fiction into the classroom was bold. Bold too was his criticism of MIT for an inadequate job of preparing its students for the extraordinary demands the contemporary world placed on engineering designers. If nuclear weaponry and power generation wasn't difficult enough, you had the challenges of the space sciences, orbital mechanics, astronavigation, and human health and survival issues in unearthly environments (Sheridan and Arnold, undated; Babcock and Davis, 1954).

However, from the standpoint of this biography the question is more about the origins of his boldness rather than the content or the need for it. How did he acquire his

boldness of thought? There was a hint of boldness in his Washburn High School Yearbook when he admitted liking to share his cleverness with others. Paulsen was not reticent or fearful in admitting an autobiographical truth, a form of daring that we describe as extroversion.

Boldness suggests proceeding where others would hesitate, as, for example, when confronting traditional or authoritative ways of behaving. The old ways may no longer serve us well. Is it time to re-examine and update them?

Then there are cultural superstitions and old wives' tales that attempt to control others with the use of curses or prayers or wishes or rules or fears. Taboos can be quite effective in inhibiting the mention of certain topics for fear of the consequences that might follow. Curse your god and lightening may strike you. Misbehave in certain ways and ostracism from the group will occur. Some taboos can help protect people, as when you are warned you may die if you eat a certain mushroom, but many more serve to restrict behavior needlessly.

In Paulsen's case the obvious taboos revolved around his sister's epilepsy. Don't mention epilepsy and it might go away or at least remain hidden. Prevent others from witnessing seizures so the epileptic won't be falsely depicted as being possessed by a malevolent spirit. Their mother, Florence, never wrote the word "epilepsy" in her 1935-1939 diary. It was noted by an "E." John lived in the presence of his sister's epilepsy for ten years, gradually becoming more accustomed to it even as its frequency and severity worsened. He had time to explore its effects in the privacy of his mind where more remoteness eased the management of its impact.

If John could emotionally cope with the abrupt and sorrowful effects of his sister's epilepsy, there may be little else in the way of taboos he could not face. It was an exploration which involved replacing the old and erroneous about the illness, with newer and truer personal experience. Boldness may not guarantee a better solution but it does carry a potential benefit. Exploration of terrain that the fearful shy from may permit the bold to discover something new and useful.

Generalist-Specialist Dichotomy

My father is often regarded as a generalist when the choice is between being a generalist or a specialist. His advocacy of comprehensive design is perhaps the biggest reason for putting him in the generalist "box." Yet his polymath deep interests of psychology, engineering, and teaching argue for the specialist side as well. His intense desire to master the skills of printing supports his specialist tendencies and raise the question of mastery, certainly a specialist trait. In running the APA design contests he had been quite vocal on his dislike of mediocre effort. Was he saying that mastery level skills were beneficial to creative problem solving or design? I don't believe he ever explained himself in that regard.

My own feeling is that he regarded skill mastery as a helpful, perhaps necessary, component of problem solving. Mastery implies the overcoming of problems. It also suggests that what lies beyond the highest level of expertise is unknown and likely problematic or mastery already would have moved on to that higher level of competence.

Problem solving is concerned with both solutions and problems. Where are you most certain to find the toughest problems waiting for you but at the boundary between the

known and the unknown, the mastered and the yet-to-be-mastered. As you work your way upwards towards greater mastery you are acquiring the traits master problem solvers need to develop — confidence, perseverance, resilience, and growing acceptance of your zone of discomfort as a challenge rather than an obstacle.

Work and Play

> We often miss opportunity because it's dressed in overalls and looks like work. —Thomas A. Edison

Arnold's love of work was uncommon. He had plenty of energy, as witnessed in his farming days in Wenham, Massachusetts. I think one of the main explanations for his enormous work ethic was the way he perceived so-called work activity. Arnold could turn the work into an opportunity to increase his competency in a skill he wanted to master. He blended a means-to-an-end view of work—get the job done— with an end-in-itself perspective—skill mastery. He was improving himself at the same time he was goal oriented in a way that was taxing.

Arnold also felt a good part of competency derived from having the right tool for the right job. That required a workshop, and in both homes he made sure a large one was in the basement. In printing that meant excellence in his printing press's capabilities and having lots of fonts for nuanced presentation of his design, whatever it might be. Learning to be skillful with tools ranks high in the mind of any mechanical engineer.

It must be remembered that what is "work" for one may be "play" for another. Arnold could turn work into play by applying creative thought to the drudgery, but would that change of perception have physical benefits for the worker? The topic is relevant, given Arnold's early death

and his abundant work ethic. Did he contribute to his own demise? It merits a deeper look.

It is often said about adversity that what doesn't kill you will make you stronger. The same might be said for work. A comfortable lifestyle, by itself, will not prepare you for the hard times. Still, it is possible to train for difficult times.

Those interested in creative problem solving are often advised to put themselves into their zone of discomfort as a way of growing their perseverance. Don't shy from the hard-to-solve problems. "Either-or" situations (work or play) are preparatory to a "both-and" solution in which work and play grow closer in similarity, facilitating completion of the work.

It should not be surprising then that Arnold was frequently confronting challenging situations as part of his own training program in the exploration of creative design. Stressors beyond some point no doubt can be unhelpful if not harmful; but where is that point?

Arnold's father, Edward, knew stressors and he had died in his mid 50s. The death of his daughter, Muriel; the failure to win government funding for the creation of an epilepsy research institute; and the growing likelihood of war in Europe with an economic depression at home all qualify as powerful stressors. Edward's father, Edwin, died late in his fourth decade, cause unknown. Did Arnold inherit a propensity for an abbreviated lifespan, which both his father and grandfather apparently shared?

We do know that Arnold's Stanford responsibilities in establishing a Comprehensive Design faculty and curriculum, as well as a Graduate School of Business curriculum, represented a heavy load. Add to that his obsessive drive to actualize himself through mastery-level

proficiency in printing skills and you have the makings of possibly harmful levels of stress. Certainly the zeitgeist of the early 1960s could be called stressful if the President of the United States invited all willing and able citizens to install fallout shelters for themselves. On top of all his other responsibilities and concerns, Arnold complied.

John's printing hobby provides us with a simple illustration of how he could make a tedious job less so by injecting it with a dose of wit. Over the years he had bought many different typefaces, so many that it became somewhat difficult for him to remember all the fonts that he had. He decided he needed a reminder and created his own collection of Type Specimen Sheets. A three-ring binder held 35 sheets like



Typefaces and their effects.
1962

the one presented on the previous page. The binder made it easy for him to add additional specimen sheets as his collection of typefaces expanded. A short phrase exemplifying each font was printed along with the size range he had for that font.

What could have become a very tedious job, was turned into creative word-play humor. “ADS wanted,” not “Want Ads.” “SIMPLE elegance in shelters” to describe fallout shelters? “Ichthyological Pollywogisms?” Where did that come from?

Yet the question remains as to whether the playfulness in his life was sufficient to nullify a significant amount of the stress arising from his health, job, actualizing efforts, and zeitgeist? I doubt it was.

Positive Psychology

The branch of psychology called Positive Psychology focuses on well-being rather than illness. Abraham Maslow and Carl Rogers, both clinicians and contemporaries of Arnold, were early members of the branch. Arnold valued their insights and often mentioned their work in his presentations and seminars.

Another pioneer was Mihály Csikszentmihályi, a Hungarian psychologist, intrigued with optimal states of human performance, creativity, and happiness. He introduced the notion of flow (Csikszentmihályi, 1988) which he described as a state of highly focused concentration or complete absorption with the activity at hand. Awareness of surroundings fades, a state of calmness prevails, time slows noticeably; there is no sense of being rushed, and arduous behavior seemingly becomes easy to perform.

Flow caught the attention of athletes as well as psychologists, thanks in part to Tim Gallwey and his book, *The Inner Game of Tennis* (Gallwey, 1974), which evolved into a six-volume sport series due to the public interest generated. Gallwey pointed out that athletes can suffer "burnout" from their efforts to perfect their performance. What began as a very enjoyable activity in the life of an athlete can turn into punishing drudgery. The net effect was damage to player motivation and performance. Practice was hurting performance rather than helping it.

To turn practice time into something beneficial Gallwey argued that one's inner game, one's mindset, had to change. Adversarial confrontation needed to be transformed, at least in part, into cooperation in order for the fun of the game to return. That would start as soon as the player began to appreciate that his own optimal performance was dependent on the quality of his opponent's game.

A well-performing opponent stimulates you to play your best game in order to have a chance at victory. The "either-or" win-lose battle changes into a more pleasant "both-and" cooperative effort as the focus shifts to excellence of performance rather than fear of losing. There is no shame if you lose while playing your best game. Perform at your highest level. Change the inner game. Arnold was skilled at this, challenging his inner self.

I came to understand that my father's extroversion was an ally in his ability to enjoy performing; any concern that he might embarrass himself in public could be banished through building empathy with the audience.

He liked being on stage as musician or actor, drum major or cheerleader, or class officer. Most interestingly, Paulsen's sociability was not the type that interfered with

introspection or hindered empathic outreach. His wit, sense of humor, his playfulness, even silliness, complemented his creative and imaginative abilities, and his relatedness skills. The inventiveness an actor needs to be convincing in his roleplaying likely helped Paulsen define his own identity as he became aware of personality traits he liked and wanted to develop further.

We know that nobody performs at their highest level continuously. Some work remains work; some stress remains. Even play may harm by extending exertion when rest would better serve the cause. The Arnold skill set of positive attributes likely helped in his efforts to manage stress. Was it sufficient?

Doing and Being

If Doing is largely problem solving then Being is what goes on in the absence of problem solving. If Doing happens in the external world around us then Being happens when we introspect or simply turn off the mind for some peace and quiet. It can be a blissful state of harmony, a respite from Doing. These two orientations of consciousness presumably can assume an "either-or" opposition or a "both-and" collaborative state in the more actualized person.

The blissful experience has been described as an altered state of consciousness—a mystical experience—because of its extraordinary characteristics (Campbell, 1949; Huxley, 1954). That being the case, you might also expect it would capture the attention of positive psychologists and anyone else interested in the mysteries of creativity and the mind.

Certainly that was the case with "flow" which seems to represent a simultaneous blend of both Doing and Being.

Milder forms of blending appear when work becomes play to one degree or another. Hypnotism is another example of a blended altered state of consciousness.

Purer forms of Being would include meditation, e.g., Transcendental Meditation, a popular movement of the 1960s, and mystical experiences where the power of non-verbal understanding entered our cultural consciousness, also in the 1960s. Psychedelic drugs like LSD, psilocybin, and mescaline quickly acquired the reputation of facilitating mystical experiences that in their absence might have taken years of practice before one experienced such a state.

What is interesting is how little evidence-based "serious" research has been devoted to altered states of mind. That makes Michael Murphy's almost 800-page compendium of extraordinary transformational aspects of the human body so unusual and notable (Murphy, 1992). His foundational presence in the human potentiality movement and the Esalen Institute will be discussed shortly.

I am suggesting that significant advances in understanding creativity may await those researchers intrigued with alternate states of consciousness, particularly those induced by psychedelics. Carlo Rovelli's life offers a fascinating example of the possibilities. He is both a creative theoretical physicist (loop quantum gravity) and a writer who has sold well over one million copies of a book on physics (Rovelli, 2016). In his rebellious university days he credited LSD with stimulating his interest in physics, having had both a powerful emotional and intellectual reaction to the psychedelic (Rovelli, 2019).

After 50 years or so of being banned, recent research with post-traumatic stress disorder (PTSD) subjects and

the chronically severely depressed who have been given psychedelics, under controlled medical supervision, have produced remarkable results that validate their suspected potential in helping previously untreatable patients. One possible (unestablished) reason for that might be that psychedelics seem able to facilitate awareness that some fears are self-created and are no longer justified (Pollan, 2018).

An early effort to study the helpful effects of psychedelics on the mind occurred at the International Foundation for Advanced Study (IFAS). Myron Stolaroff, a Stanford graduate of electrical engineering (MS, 1941) who worked at Ampex Corporation for many years, founded IFAS in 1960 in Menlo Park, near Stanford University. Its purpose was the clinical study of the drugs' healthful effects on the human mind, one of which possibly being creative problem solving.

After Arnold died, colleague Robert McKim and a small group of engineers conducted a pilot study at IFAS on creative problem solving while under the influence of psychedelics (Harmon, et al., 1966). The results were promising. However, federal legislation to control psychedelics abruptly ended their clinical use until recently.

Human Potential Movement

Interest in human potentialities grew, despite legislation controlling the use of psychedelics. Another former Stanford graduate, Michael Murphy, co-founded the Esalen Institute in 1962 to that end at Big Sur on the California coast. Seminars attracted Stanford engineering faculty to hear speakers such as Aldous Huxley discuss human non-verbal potentialities like intuitive knowledge (e.g., "fairness") that we all seem to possess.

My father was fully aware of such developments and was highly interested in the possibilities they augured for human development. He never experienced psychedelic drugs due to their unknown effect on the heart and how it might impact him as a heart attack survivor. His death in 1963 happened right at the flowering of the Human Potential Movement.

It is easy to imagine Arnold being highly supportive of the Being side of consciousness development, as it seemed conducive to creative thought. Yet to anyone who knew of his prodigious work ethic, Being might be viewed as an after-thought in his mentality. Overwhelmingly it seemed his hobbies from construction to filmmaking and printing were of the "learn by doing" variety: The learning is in the doing.

Arnold's apparent one-sidedness would be an unfair characterization for several reasons. For one thing he could turn work into play, a blend of Doing and Being. For another his word play and silliness are easily seen years prior in the creative aspects of Arcturus IV (remember the Methanian plant, Herbivorous Carnivorous Arnoldious) as well as in his type specimen sheets of Stanford vintage. Just about every aspect of "Work & Win" argues that Arnold was no stranger to Being. Johnny was not all work and no play. His creations captured the fun he was having.

Perhaps the question is what might be the optimal blend of Doing and Being? In that regard a 2004 Nobel laureate in Physics, Frank Wilczek, had something to say about Being. He described a mystic moment he experienced at the Brookhaven National Laboratory as a young scientist (Wilczek, 2021; emphasis added):

> And then it happened. It came to me, viscerally, that the intricate calculations I'd done using pen and paper (and

wastebasket) might somehow describe this entirely different realm of existence—namely, a physical world of particles, tracks, and electronic signals, created by the kind of machinery I was looking at. **There was no need to choose, as philosophers often struggled to do, between mind or matter. It was mind and matter.** How could that be? Why should it be? Yet I somehow, I suddenly knew that it could be so, and should be so.

That was my mystical experience. I warned you that it was ineffable.

The second [William] James criterion is what he called a noetic quality. Mystical experiences must be "states of insight into depths of truth unplumbed by the discursive intellect. They are illuminations, revelations, full of significance and importance [and] carry with them a curious sense of authority." **My revelation was instantaneous and utterly convincing. For me, ever since, it's been axiomatic that good ideas are the best guide to reality, and vice versa.**

In the first paragraph of Wilczek's revelation the added bold emphasis highlights how non-verbally an "either-or" mindset of the intangible world of mathematics offset by a physical world of particles suddenly changed into a "both-and" mindset of greater import and meaning.

The third paragraph notes the feeling of ineffable profundity of the revelation and its indisputable authoritative nature. Its authenticity and truthfulness were beyond doubt—intuitive knowledge of the highest order.

In the last sentence Wilczek acknowledges that the intangible world is bidirectionally connected with the tangible.

Wilczek has given us a great example of how Being and Doing can reinforce each other.

The Child is Father to the Man

This book began with the question of whether Arnold presented early predictive signs of who he would become as an adult. Could I credibly identify such from my investigation of his youth?

The answer will take two forms, using both an objective and a personal point of view. From an objective perspective aptitude testing was first used extensively by the military during WWI as a superior way to match abilities to job requirements. As far as we know, Paulsen's aptitudes were never tested.

The 1930 Washburn Yearbook noted his high intelligence, leadership qualities, strong interest in music, dramatics, and printing/publishing. That makes me feel confident that the arts and perhaps business with its need for executive skills might be recommended by a career counselor for his consideration. If Paulsen confessed a love of Tom Swift's inventiveness to the councilor, perhaps engineering might have been recommended as well.

From a personal perspective, what surprised me the most about my father was his extroversion and his pleasure in performing before an audience. My feeling is that extroversion can be very helpful, if not essential, in creative expression, be it music, drama, public speaking, and anything else that occurs in a group of people, such as teaching, and publishing with its more abstracted readership audience.

Empathy, an acknowledged aid to creative problem solving, seems associated with extroversion, roleplaying, and the use of one's imagination. Invention is aided by playfulness and imagination, and wit. These aspects of Paulsen's personality may admittedly be easier to see with

hindsight rather than foresight but nonetheless were present.

So where is psychology as a career direction in this mix of traits and abilities? It seems absent. A major reason for that, I think, has to do with the timing of the mental maturity we need to have before psychological processes become of conscious interest. It takes time. Paulsen's interest in the inventive process reveals the prerequisites were there. If Psychology had been part of the Washburn curriculum, Paulsen might have chosen it.

The child is—to a degree—the father of the man. Many ingredients of the man come from childhood but not all. The adult continues to learn and develop emotional and intellectual qualities and skills the child lacked. But in this case, the curiosity, the imagination, the native intelligence, the extroversion, and so on—all so important to creativity—were present and active in the child as aptitudes, only grew more-so in the man. What Paulsen revealed in his high-school days about his abilities, his personality, and his identity were highly predictive of their future prominence in his life as he redefined engineering design into creative problem solving of a higher order, one that insisted the solution advance our and society's well-being. With the exception of journalism and publishing, a particular vocational direction was not evident at that point in Paulsen's life; but his set of aptitudes was. They were of widespread usefulness in a number of vocations that would include teaching, psychology, engineering, and business.

What is most apparent is that Arnold was a great practitioner of learning by doing, something that John Dewey, a highly influential American psychologist, educator and philosopher, thought was the essence of education

(Dewey, 1897). From earliest school years Paulsen was an active reader. His high-school years were filled with his active participation in music, dramatics, leadership positions, journalism, and printing for business and pleasure. He was perpetually occupied and learning.

10: Conclusions—Unfinished Story?

> You live life looking forward; you understand it looking backwards. —Søren Kierkegaard
>
> What feels like the end is often the beginning. —Unknown
>
> In order to attain the impossible one must attempt the absurd. —Miguel de Cervantes

My father's early death cut short a promising career, so yes, his life story was unfinished. It is difficult not to feel we all are the lesser for his early demise. He never put the entirety of his vision for comprehensive design into book form. Until Bill Clancey appeared with his Wikipedia article on my father, Arnold came very close to exemplifying the academic "publish or perish" axiom. The most important credential for a university faculty member to possess in order to achieve tenured security is his published research and philosophy. Failing that, a positive reputation of his contributions, alive in the minds of his colleagues, might delay his perishing until they too passed on.

It would seem that most of us are going to wind up as unfinished stories as well, for who dies having all their questions answered, all their fears and doubts resolved, all their worries gone, all their goals completed?

It is unimaginable that we will ever be free of problems that need fixing. Experience teaches us to remain vigilant about unanticipated negative consequences of our latest solutions. Will humanity ever be free of warfare or poverty or litigation? The complexity of human beings and their

ever-evolving societies will not be transformed into frictionless and peacefully functioning systems overnight, if ever.

As our societies and technologies grow evermore complex, will the idea of progress recede from our thoughts and expectations? Will global climate change eventually make Earth uninhabitable for us? Is it our fate to witness our own demise as a species?

As a people we have experimented numerous times with creating utopian communities. The idea of utopias has probably been with us at least since the time of agricultural settlements and the division of labor. The Bible had its Garden of Eden but not for long, ending with God's banishment of Adam and Eve from the territory. The Shakers' experiment seems to have lasted the longest by far, having started in the mid-eighteenth century. As of 2021 they remain, but only in Maine in a community with less than five members.

Our difficulties in getting along with each other have to be one of the most intractable problems we face. Our lifespans have increased impressively over the past 150 years but not our emotional equanimity. Life is an ongoing experiment with an uncertain future. Species go extinct all the time. It's an unfinished story.

Middle Earth

We face a dilemma, a very old one in humanity's collective history. With Heaven above us and Hell below, we find ourselves stuck between them without an exit while we live. Consider the Mexican perspective. Former President Porfirio Díaz described it as: "Poor Mexico, so far from God, so close to the United States."

What are we to do? Can we genuinely improve our lot; can we progress as a people and transcend our limitations as individuals? In our society at every level of organization from local to national we have established groups and organizations designed to aid people. Groups are found inside and outside of government, whose purpose it is to defend our rights of self-determination. It is a basis of our political system: Life, Liberty, and the pursuit of Happiness. We have health services, and educational systems, small charities and large non-governmental organizations, fire and police and law enforcement agencies, libraries, and hospitals. We have representative government and freedom of worship—a framework for its citizens to live a self-determined and purposeful life.

These groups help, but our need for them continues unabated with each new generation. The Peace Corps was supposed to work its way out of existence with its successes. That has not happened. Conflicts remain. Bad money still drives out good. Human nature is not easy to change.

Many problems accompany us from generation to generation and require updating the solutions as circumstances change, be they issues of food production, security, conflict resolution, health or whatever.

Because of this, Buckminster Fuller advised shifting the spotlight from attempts to change human nature to improving the technologies that people use. John Arnold agreed and went further and promoted self-actualization. We might fail in attempts to change others but it could still be possible for each of us to change ourselves, if we so choose.

Gifts

The ultimate intangible-to-tangible journey is the creation of bodily life. Thereafter the child will begin to explore his inner and outer worlds, discovering their contents and how they relate to all else in this world. That expansion of consciousness brings with it feelings of wonder and awe as we become aware of our inexplicably good fortune of being alive and able to explore, discover, and learn. What is happiness if it is not emotion tied to sensing the wonder of aliveness and vitality?

As we come to understand what a momentous gift life is, we, in gratitude, may become inspired to give gifts to others, for them to enjoy and benefit from. Arnold was insistent that any problem-solving solution be better than what preceded it. Such a solution carries value and thereby can be considered to be a gift. Inventions and technology in general are commonly viewed from this perspective (Campbell, 1949), which helps explain the concept of progress and technology's role in helping society advance.

Few would object to the claim that the only constant found within the universe is change itself. On Middle Earth better designs bestow blessings, but we know that nothing —happiness (or sadness), peace (or war), kindness (or meanness)—endures forever. The world's unceasing flux as societal complexity grows, necessitates better and more comprehensive design if progress is to continue. The more creative and better the solution, the more potentially transforming its effect on people might be. "Better" is the sine qua non of good solutions and gifts. "Better" is also a part of the motive to improve or transform oneself.

Self-Determination

Much of my father's philosophy is captured in the concept of self-determinism which relies on three contributing concepts: autonomy, competence, and relatedness. We strive to control our destiny. The more competent we are in doing so, the more self-determined we become. That very much includes relationships—with oneself, with another person and with groups. Self-determination is more an effort of "becoming" than of "being," and in that sense connotes "transformation" and "change" rather than "permanence."

If we are the creators of the stories we tell to ourselves, about ourselves, that we believe, then we are responsible for our own well-being. Creative problem solving should help us get there—"there" being not necessarily a final destination or goal, but steps in the right direction. It means knowing what we truly care about and the kind of life we want to live. Needless to say, finding your life's purpose can take a long time and carries no guarantees that you will.

A frequently heard question of childhood is "What do you want to be when you grow up?" My father at age nine saw himself as a medical missionary, but later became a psychologist and engineer. I doubt that immigrant pioneers, as children, anticipated leaving their homeland and friends one day to invent a better life for themselves and their families elsewhere. As youngsters we often don't know what we ultimately will want for ourselves.

A person who did know as a child what she wanted to do as a adult was Virginia Satir, a renowned family therapist. When she was three years old she taught herself to read, and at age five she decided that when she grew up she would be a detective of parental-child relationships.

That led her to settle near Stanford many years later where she co-founded the Mental Research Institute in 1958. By 1962 she became the first to offer formal family therapy training to others. I don't know if she and Arnold ever met but in outlook and philosophy they seemed much aligned, both self-determined psychologist/engineer-designers of people.

Her mantra was "peace within, peace between, and peace among," a "both-and" orientation to relatedness. I mention her because of her own uncommonness. How many of us at that age could offer even a guess about what we might be doing as an adult, let alone achieve the vision? I find it impressive that some are able to do so—the uncommon ones.

In 1972 Satir published a poem called "I Am Me." It reminded me in some respects of the Edgar Guest poem "It Couldn't Be Done" that Arnold liked (toward the end of Chapter 7). See if you agree.

I Am Me (excerpted; emphasis added)

My declaration of self-esteem

*I am **me**.*
In all the world, there is no one else exactly like me.
*Everything that comes out of me is authentically mine because I alone **chose** it…*

*If later some parts of how I looked, sounded, thought and felt turned out to be unfitting, I can discard that which is unfitting, keep the rest, and **invent** something new for that which I discarded –*

I can see, hear, feel, think, say, and do.
*I have the **tools** to survive, to be close to others, to be productive, and to make **sense and order** out of the world of people and things outside of me –*

I own me, and
therefore I can ***engineer*** *me –*

I am me and

I AM OKAY.

Purposefulness

An inherent component of self-determination seems to be purposefulness, the intentionality to accomplish one's goals.

In my father's case a big step in that direction occurred with his name change from Paulsen to Arnold, acknowledging his great grandfather, Paul Olsen Arneklev's pioneer life in America. Arnold's father, Ed, revealed purposefulness when he broke new ground as a University of MN School of Medicine graduate. In similar fashion, John did so when he entered MIT's School of Engineering. His ability to compress a five-year program into just three years, is strong evidence of purposefulness.

Arnold's purposefulness continued as later seen efforts to move engineering design away from drafting and towards creative problem solving and self-actualization. His inventiveness after Arcturus IV primarily was aimed at overcoming blocks to one's creativity and actualization. We must unlearn the "either-or" oppositions before we can discover "both-and" ways of thinking and behaving.

Remarkably, both Arnold and Satir felt the individual had the capability to design a better future for themselves through striving for autonomy, competence, and relatedness to themselves and others. We tend to judge youngsters as prematurely purposeful if they readily

engage with their environment from infancy. That was true for Arnold and Satir.

Transformation

Transformation has been an ongoing theme of the biography. It is implied in problem-solving solutions, in the desire to change an aspect of your identity and personality, and in the journey from intangible to tangible that inventions undergo. The disruptions of war, pandemics, and economic depressions are transformative on a large scale. Mastery requires transformation of mediocrity into something closer to perfection. It is the hoped-for result of mentor-trainee relationships. It includes what happens when "either-or" oppositions turn into "both-and" relationships.

A well-loved example of transformation is *A Christmas Carol* by Charles Dickens. It almost instantly became a best seller and later on, with time, it grew into a literary classic. Never to this day has it gone out of print in the 180 years since its publication in 1843.[6] In my mind its popularity is because Dickens succeeded in showing that even a mean old miser like Ebenezer Scrooge can change himself into a kind, generous, and lovable human being, after having lived much of his life in the opposite fashion.

Dickens himself learned early on what the desire to transform oneself felt like. His own childhood was painful at times. His father was sent to debtors' prison for his unpaid bills. That prompted Charles to quit school and go to work in a boot black business for long hours under terrible work conditions—cold, derelict buildings with rats ruling the dark and damp basements, with intimidating bosses above

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6 Much of the Dickens background comes from the Wikipedia article on his life. See References.

yelling at the young workers. Dickens grew up feeling a great many adults cared not a whit about him and the other children who had to work. Such lack of empathy is clearly visible in *David Copperfield* and *Oliver Twist*.

Still, Charles Dickens' childhood was not all bad. He experienced some loving years within his family and without. He understood that children need not and should not be maltreated. As a London journalist he advocated an end to abuse of children in school and at work.

Dickens was thirty-one when *A Christmas Carol* was published. His creation of Ebenezer Scrooge has remained unforgettable ever since, as has the Ghost of Marley, Scrooge's former business partner, and the Ghosts of Christmas Past, Present, and Yet-to-Be. Who is not attracted to a good ghost story?

The ghosts revive memories in Ebenezer of his past and present, as they invisibly spy on people who were part of his life. Through the literary artifice of using ghosts, Dickens prepares Scrooge (and the reader) for transformation. (I intentionally left unmentioned Ebenezer's visits made with the Ghost of Christmas Yet-To-Be in hopes readers will discover for themselves what might have been be waiting for Scrooge.)

Early on, Scrooge is reminded that it was his sister who helped him escape the loneliness of boarding school during the Christmas break from classroom lessons. He was not unlikable at this point in his life. Ebenezer saw his sister grow into a loving mother of a son, Fred, who manifested his mother's trait of kindness as he told friends about Scrooge's sad path into a life of stinginess and loneliness, disliked by most who met him.

Scrooge was forced to recall some painful memories about his courting years when his fiancée ended their relationship due to his neglect of her for his greater love of money. Ebenezer witnessed her current life as a happy wife and mother, fulfilled by her family, in stark contrast to the uncharitable life of discontent that Scrooge had shaped for himself, one without solace of family and friends.

Feelings of empathy begin to grow inside Ebenezer as he observes his employee, Bob Cratchit, and wife struggling to cope with young Tiny Tim, a gravely sick member of the family. Ebenezer can see that his own stinginess played a large role in the Cratchit family's miseries. Scrooge seemed to believe that close-to-starvation wages were necessary before gratitude for employment could be assumed.

By the time the Ghosts of Christmas depart Ebenezer, the contrast between himself and those around him becomes intolerable.

On Christmas morning Scrooge awakens with the certitude that his life need not be as it has been. He has a choice and he has the resources to change his behavior. He's in a problem-solving frame of mind. He grasps that by helping Cratchit he simultaneously is helping himself transform into someone better. It is inspiring to witness. No longer is Scrooge in an adversarial relationship with Cratchit. It has become "both-and" for them, a win for Scrooge and the Cratchit family. It just required that Scrooge see the world with a new and empathetic perspective. The tools Ebenezer needed for transformation he had since birth; they just need to be used.

There can be no doubt that Charles Dickens was an uncommon man, as was my father. They were both smart, extroverted, witty, and self-determined. They both were

motivated to advance the well-being of others. Both were demonstrably creative. What I find most intriguing was that they both sought membership in the Garrick Club. Dickens was almost a founding member of the London Club (1831), which thrives to this day. A bit more than one hundred years later and in Minneapolis, Paulsen was accepted into an American version of the club. Both clubs were similar, limiting membership to non-boring men (i.e., witty) who were devoted to the arts, especially the dramatic arts.

Why should that be? What is there about the performing arts which attracts such men? I would suggest that at least, part of the answer is that "onstage" is a wonderful spot for an extrovert to be. Audience feedback is immediate and rather obvious. If you, the player on the stage, can put yourself in someone else's shoes and mind, it is because you have become skilled in emotional intelligence and the imaginative exploration of your character's personality. That skill should also help you connect with the audience. If performers (and authors) are skilled enough to accomplish that, you can conclude that they well know themselves.

Dickens in his early adulthood (late teens in that era) acquired many of those relatedness skills. He became enthralled with daily observations of the rehearsals of a theatrical group nearby. Later at the law office where he was employed as a junior clerk he would impersonate those around him (clients, lawyers, and clerks). He memorized the farcical monologues of a favorite performer and in the latter stages of his life Dickens gave frequent public readings from his works, especially *A Christmas Carol*. He enjoyed performing.

The overlap of Dickens' and Arnold's personalities is striking, even to the extent of their high energy levels and

work habits. Dickens died at 58, a renowned citizen of the world, and the school of life, including the theatre.

Emotional Intelligence

> There is as much difference between us and ourselves as between us and others. —Michel de Montaigne

During Arnold's lifetime the concept of emotional intelligence did not exist as an organized topic of discussion or consideration. Yet components of it like empathy, so important for Satir's and Dickens' efforts in individual and group transformation, certainly did exist. Arnold's love of acting reflected it, as did his public speaking and leadership roles. Emotional intelligence was built into brainstorming as non-critical acceptance of an idea during the initial generative phase of the process. Creativity in general seemingly cannot be courted without a good deal of emotional intelligence—the fun of playfulness, imagination, humor, and curiosity.

Our emotions can facilitate or impede problem solving and other behaviors. If we can learn to pair desired emotions to specific behaviors and situations, we might find our effectiveness vastly improved. That is what Tim Gallwey illustrated in his book on *The Inner Game of Tennis*. Master your emotions and you will perform closer to your optimal level. That defines emotional intelligence. Humor can defuse a tense situation. Anger can ignite it.

We can gain control of very powerful emotions as we learn how to substitute gratitude for sorrow. It is our choice as to what we focus on, the pain of loss or the pleasure we gained from having known and loved a departed one. While it is true that we are born with some instincts and reflexive responses, it would be a mistake to believe we have no control over our emotions.

We are not born with innate feelings of boredom. It often accompanies inactivity, but not always. Sometimes we delight in inactivity when we feel exhausted and want to rest. Sometimes we whistle to dismiss fear as we march with heads held high. We choose our attitude which affects our emotions.

Lisa Feldman Barrett is both a psychologist and a neuroscientist. Her theory of "constructed emotion" (Barrett, 2017) advances the idea that emotions are built step by step from our relatively undifferentiated bodily feelings and moods—our affect—into more specific and differentiated emotions via our interactions, both social and otherwise, with our environment. Your brain predicts (guesses) the *differentiated* emotion you have constructed based on past contextual history. It is learned behavior developed over time from a cognitive emotional model that each of us creates whether we are aware of it or not.

Note that only you can change your emotions. That makes you responsible for them. Will you walk on the sunny side of the street? Are your friend's tears representative of sorrow or joy? Much about your behavior will depend on your interpretations of their emotions and your own. Arnold helped his own cause time and again by turning work into play. Is the glass half full or half empty? Did the knots in your stomach originate from fear or excitement or both?

You perhaps already have gathered that Barrett's constructed emotions fit nicely in a theory of psychological self-determination and transformation. The earlier you can learn to manage and control your emotions, the sooner you can advance your own development. Many elementary schools now have instituted SEL programs (Social and Emotional Learning) for that reason.

Terra Incognita

The great early maritime explorers—Columbus, Magellan, Vasco de Gama—discovered global sea routes and territory, but the territory remained largely unknown, awaiting later explorers like the Spanish conquistadors, Hernán Cortés, Francisco Pizarro, Hernando de Soto, and others who came looking for cities of gold, the fountain of eternal youth, and more recently the canals of Mars, the Loch Ness monster, and Big Foot.

Today there remains ample Terra Incognita to be discovered and explored both within us and outside us in the world. Within lie our consciousness and the affective lands of emotion, mood, and feelings. Outside awaits the incomprehensibly large expanse of space to explore, discover, and learn from. It would seem that as long as curiosity abounds, the story will remain unfinished.

You can understand that fear may keep you from crossing a high and decrepit-looking bridge over a roaring river to enter a new land of possibilities. Can you also understand that you created that fear? In your imagination can you examine the fear, look at it from different perspectives and distances, and begin to understand how it does its work of inhibiting you? Can you see that you are responsible for its management? As Satir said in her poem, you can engineer a transformation by modifying the emotion into a much less fearsome thing. In similar fashion Arnold spent years of transformative work in problem-solving process and methodology, most notably in the affective and cognitive blocks to creativity by culture, society, and individuals.

Perhaps you can even see yourself replacing fear with feelings of excitement as you prepare to cross the bridge and step into a new world of opportunities. That is where

Joseph Campbell's doors await your arrival, prepared to open at your knock.

It is territory which attracts the pioneers, the explorers, the imaginative ones…You too?

Design

Can you have Intentionality and Purposefulness and Transformation without Design? What is a story without a plot or a chef without recipes? Good designs will propagate; they will be copied and passed to others. They will evolve as changes are incorporated into the design because of new situational variations. Bad designs eventually will go extinct. That is how our culture and technology and society evolve.

Arnold's Arcturus IV case study evolved into his Creative Engineering Laboratory at MIT and later into the Design Division at Stanford, and still later into its "d.school," the Hasso Plattner Institute of Design (Doorley, et al., 2021-2022). Definitive analysis of how all that happened can be found in Bill Clancey's two volumes on John Arnold: *Creative Engineering* (Arnold (1959) 2016) and the forthcoming *Philosophy of Comprehensive Design* (Clancey, 2024). They are the next best thing to the yet-to-be-discovered magnum opus by Arnold himself.

A grand theme driving humanity's accumulated knowledge is the advancement of our abilities to utilize what we know for our own improved well-being. If we want a clean, non-polluting means of producing energy, controlled fusion of hydrogen nuclei could help us get there. Cold fusion at room temperatures would be much better, but that remains just science fiction at this point.

High-temperature superconductivity of electricity appears much closer at hand. The biochemistry of life as

we have come to understand it gives us the ability to begin to modify our genes, and hence our slow and deliberate entrance into human designed evolution, perhaps one in which even more creativity, imagination, and wisdom are incorporated.

If we are to successfully explore our own Milky Way galaxy, an ability to nullify gravity's hindrance of our ease of travel would be wonderful. UFOs seem to exhibit that capability. If we had the alchemistic skill to transform any element into any other, what couldn't we manufacture with ease anywhere we happened to be? Terraforming inhospitable planets like Mars into places more like Earth would become easier.

All that will be required is a lot more of what we have already been doing or trying to do in the areas of problem solving, creativity, and transformation.

Our story likely will remain unfinished as far into the future as we can imagine. The dreams of today's space travel will depend on comprehensive designers, just as Arnold imagined seventy years ago when they played an essential role in the Arcturus IV case study in helping to satisfy the Methanians' needs in non-exploitative fashion.

Most exciting of all is that today's comprehensive designer may soon have at his side the rapidly evolving power of artificial intelligence—that is, if it can be tamed to serve our betterment without unanticipated negative consequences.

That would please John Arnold to his very core.



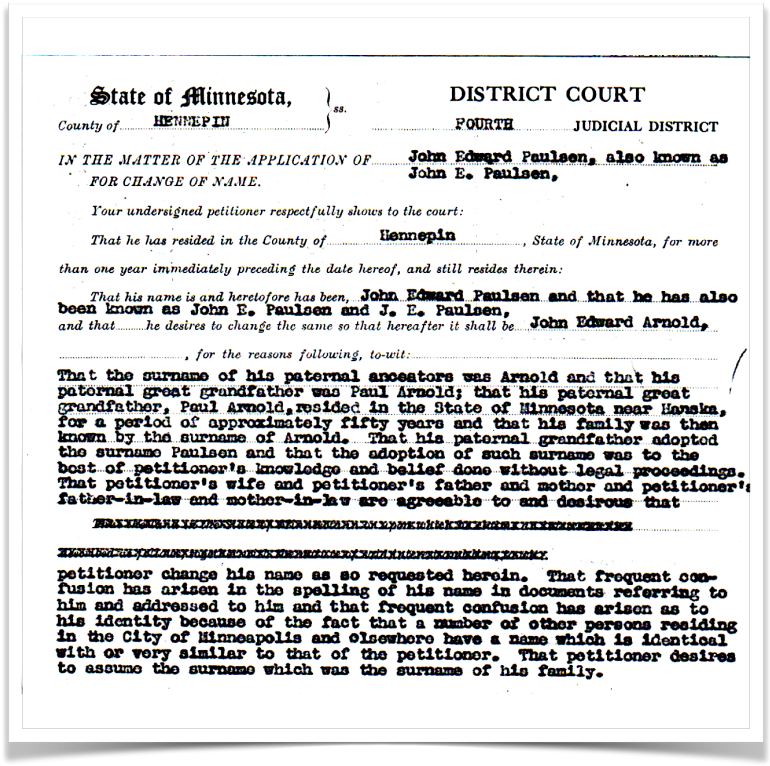
The Last Comic Strip of Calvin and Hobbes

SCRIPT



12/31/1995

Appendix 1: Change of Name Petition



State of Minnesota, } ss.
County of HENNEPIN }

DISTRICT COURT
FOURTH JUDICIAL DISTRICT

IN THE MATTER OF THE APPLICATION OF John Edward Paulsen, also known as John E. Paulsen,
FOR CHANGE OF NAME.

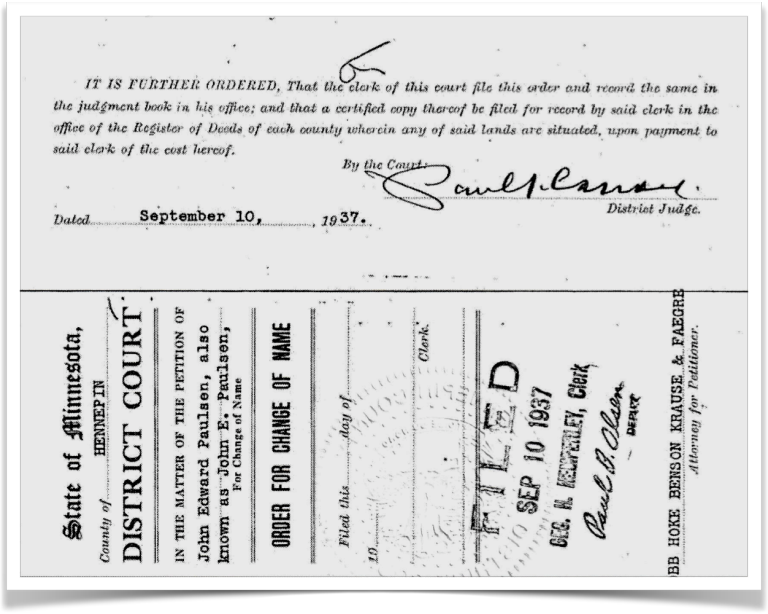
Your undersigned petitioner respectfully shows to the court:

That he has resided in the County of Hennepin, State of Minnesota, for more than one year immediately preceding the date hereof, and still resides therein:

That his name is and heretofore has been, John Edward Paulsen and that he has also been known as John E. Paulsen and J. E. Paulsen, and that he desires to change the same so that hereafter it shall be John Edward Arnold, for the reasons following, to-wit:

That the surname of his paternal ancestors was Arnold and that his paternal great grandfather was Paul Arnold; that his paternal great grandfather, Paul Arnold, resided in the State of Minnesota near Hanska, for a period of approximately fifty years and that his family was then known by the surname of Arnold. That his paternal grandfather adopted the surname Paulsen and that the adoption of such surname was to the best of petitioner's knowledge and belief done without legal proceedings. That petitioner's wife and petitioner's father and mother and petitioner's father-in-law and mother-in-law are agreeable to and desirous that [redacted] petitioner change his name as so requested herein. That frequent confusion has arisen in the spelling of his name in documents referring to him and addressed to him and that frequent confusion has arisen as to his identity because of the fact that a number of other persons residing in the City of Minneapolis and elsewhere have a name which is identical with or very similar to that of the petitioner. That petitioner desires to assume the surname which was the surname of his family.

September 7, 1937



IT IS FURTHER ORDERED, That the clerk of this court file this order and record the same in the judgment book in his office; and that a certified copy thereof be filed for record by said clerk in the office of the Register of Deeds of each county wherein any of said lands are situated, upon payment to said clerk of the cost hereof.

By the Court:

Paul P. Carroll
District Judge.

Dated September 10, 1937.

State of Minnesota,
County of HENNEPIN
DISTRICT COURT

IN THE MATTER OF THE PETITION OF
John Edward Paulsen, also
known as John E. Paulsen,
For Change of Name

ORDER FOR CHANGE OF NAME

Filed this ... day of ...
19...
... Clerk.

FILED
SEP 10 1937
GEO. H. KEARNEY, Clerk
Paul B. Olson
DEPUTY

BB HOKE BENSON KRAUSE & FAEGRE
Attorney for Petitioner.

Filing of Name Change, September 10, 1937

A**ppendix 2:** Proposed Institute Bill

A BILL

TO PROVIDE, FOSTER, AND AID IN COORDINATING RESEARCH RELATING TO EPILEPSY, AND OTHER ALLIED NERVOUS DISORDERS

and

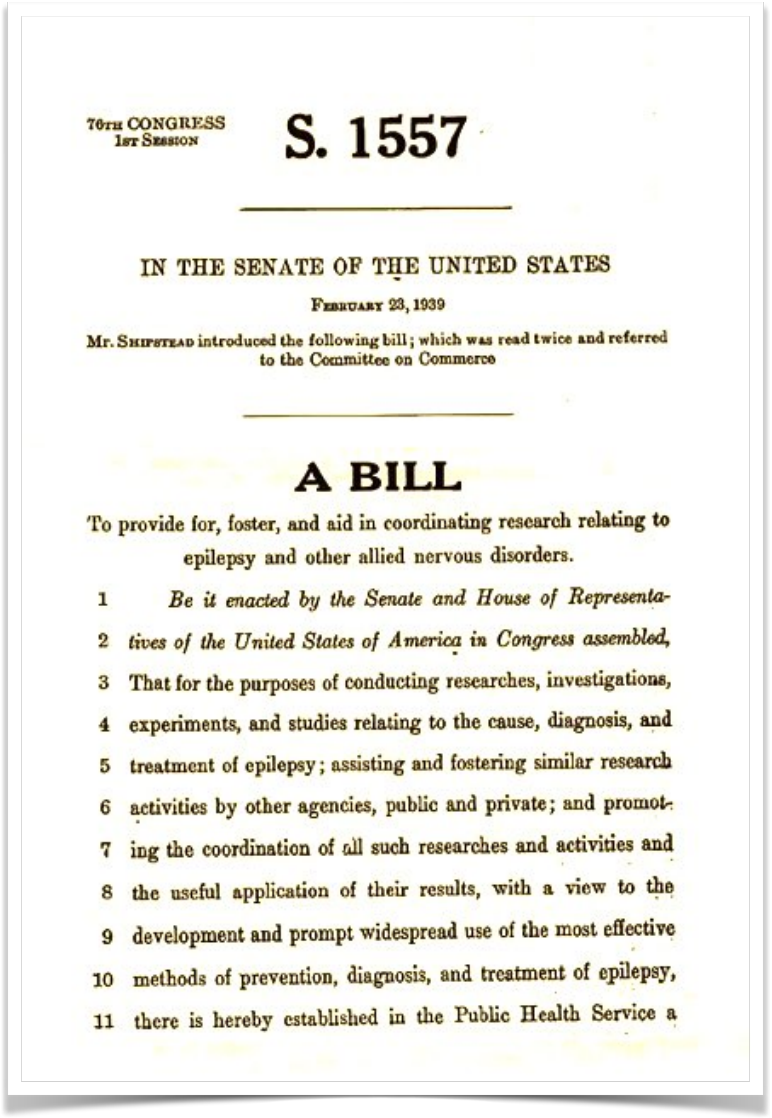
INFORMATION AND ARGUMENTS IN FAVOR OF SUCH A BILL

Data Prepared and Assembled from Current Literature on the Subject

by

Dr. Edward L. Paulsen
840 La Salle Building
Minneapolis, Minnesota

January, 1939



76TH CONGRESS
1ST SESSION

S. 1557

IN THE SENATE OF THE UNITED STATES

FEBRUARY 23, 1939

Mr. SHIPSTEAD introduced the following bill; which was read twice and referred to the Committee on Commerce

A BILL

To provide for, foster, and aid in coordinating research relating to epilepsy and other allied nervous disorders.

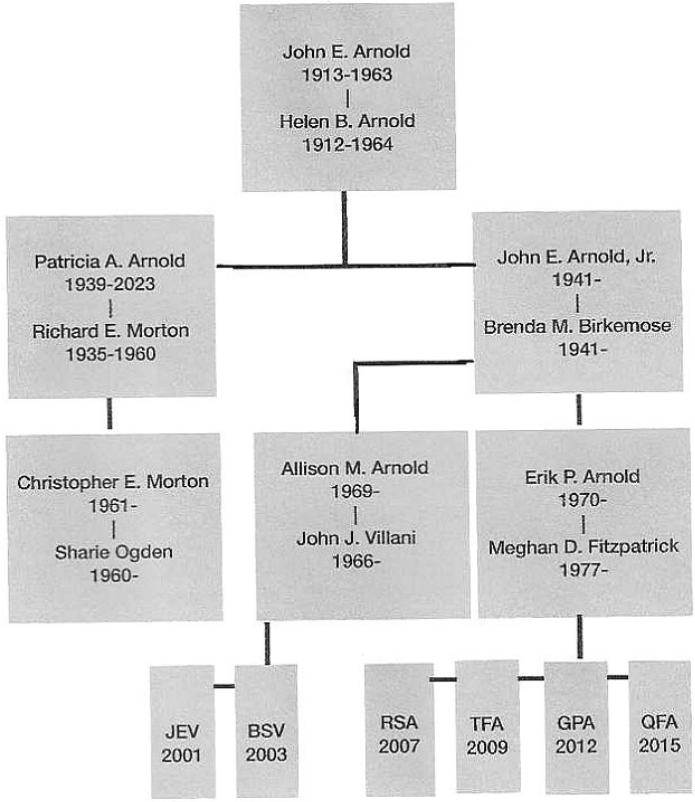
Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purposes of conducting researches, investigations, experiments, and studies relating to the cause, diagnosis, and treatment of epilepsy; assisting and fostering similar research activities by other agencies, public and private; and promoting the coordination of all such researches and activities and the useful application of their results, with a view to the development and prompt widespread use of the most effective methods of prevention, diagnosis, and treatment of epilepsy, there is hereby established in the Public Health Service a

S. 1557 introduced, Feb. 23, 1939, to the Commerce Committee

Appendix 3: Paulsen/Arnold Ancestors

Gener-ation	Name	Dates	Birthplace
1	**Paul Olsen Arneklev**	1822 - 1908	Norway
1	Wife: Tolline T.	1822 - 1894	Norway
2	Son Edwin	1848 - 1896	Norway
2	**Edwin Meyer Paulson**	1848 - 1896	Norway
2	Wife: Anne H.	1850 - 1923	Norway
3	5 sons & 5 daughters	1869 - 1969	USA
3	**Edward L. Paulsen**	1883 - 1939	USA
3	Wife: Florence N.	1887 - 1975	USA
4	Muriel Anne	1912 - 1912	USA
4	John Edward	1913 - 1963	USA
4	Muriel Anne	1914 - 1937	USA
4	**John Edward Paulsen/Arnold**	1913 - 1963	Minneapolis MN
4	Wife: Helen B.	1912 - 1964	Minneapolis MN
5	Patricia Ann (Penny)	1939 - 2023	Boston, MA
5	John Jr. (Jack)	1941 -	Boston, MA

Arnold Descendants



Appendix 4: Memorial Resolution

John Edward Arnold

1913-1963

John Edward Arnold was born on March 14, 1913, in Minneapolis, Minnesota. He received his B.A. in 1934 from the University of Minnesota and his M.S. in 1940 from M.I.T. He joined the Stanford faculty in 1957 serving jointly as Professor of Mechanical Engineering and Professor of Business Administration. He directed the Design Division of the Mechanical Engineering Department. Before coming to Stanford he taught at M.I.T. from 1942 to 1957. On September 28, 1963, he died while traveling in Italy. Educator, engineer, philosopher, consultant to industry, amateur printer, outdoorsman—John Edward Arnold was many things. Statistics do not measure the man nor assess the community's loss at his death.

John Arnold was, perhaps, best known for his contributions to educational philosophy in engineering design. In an era of analytical technological revolution he was an outspoken advocate of synthesis in technology. He felt that a thorough understanding of the creative process was essential in life, and particularly in engineering. How else but by creative synthesis and daring design could mankind meet the needs and challenges of this modern age? He believed in generalism—his concept of the "ultimate designer"

stressed fluency of thought and zest for technology on a broad spectrum.

John Arnold's concepts of life and man were reflected in his deeds. A prodigious worker, he was full master of nearly every task he undertook—and these reflected an extraordinary breadth of interest. Following his graduation from Minnesota he owned and operated a local garage. He was an engineer and designer in industry both before and after obtaining his M.S. from M.I.T. On first joining the M.I.T. faculty he taught courses in Engineering Mechanics, both at the undergraduate and graduate levels. His interests in teaching turned toward engineering design and he soon built a worldwide reputation as an innovator in educational philosophy. His courses and summer institutes in Creative Engineering serve as clear landmarks—they were the first substantial efforts at developing the creative potential of engineering designers. He directed the educational television program for two years at M.I.T., appearing in or directing more than a hundred broadcasts. He was President of the Faculty Club.

Concurrently with these activities he himself built a substantial portion of his charming home in the suburbs and perfected his skills as an amateur printer and photographer. A yearly event for his colleagues was the spring day he brought to market the fleeces he had shorn from his sheep the previous weekend.

He was in great demand as a consultant to industry and to governmental agencies, where he promulgated his ideas of creativity in engineering.

John Arnold joined the Stanford faculty six years ago. Between then and now he built the Design Division of the Mechanical Engineering Department into a nationally recognized position of excellence in education. He initiated courses in the Management of

Research and Development— hallmark courses in training the managerial leaders of our nation's growth in technology. The areas of his interest are, largely by his efforts, among the fastest growing in the University..

John Arnold was a visionary thinker. Not one to follow, he set trends in design education. Not one to command, he led colleagues by his example. Not one to falter, his firm pace forward in lecture and laboratory motivated students to give more than minimum efforts. Warmly human, an outstanding and articulate speaker, he was sought by many groups to contribute to their programs. Reflecting on our remembrances of him we know—John Edward Arnold was an uncommon man. His death is noted with melancholy and sadness.

William M. Kays, Chairman; Peter Z. Bulkeley, Carlton A. Pederson

Appendix 5: Trials of a Tyro

Trials of a Tyro

For some reason or other, I find it difficult to write with my usual feeling of confidence. Perhaps, it is because I'm trying to write on a subject in which I'm ill prepared. Not because of lack of interest, for I have that to a high degree, but because of a very definite lack of experience. I have the feeling that the new (to me) facts that I am constantly learning about the art of printing are old hat to everyone else and, therefore, of little general interest. What seems to me as exciting experimentation and glorious discovery would undoubtedly illicit a bored *so what* from the experienced.

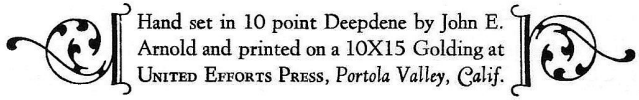
While printing has been a hobby for the past 35 year and one of many hobbies over a longer period of time, it is only during the last year or so that I have been anything more than a dilettante. The preceeding 34 years of printing were limited, except for a few rare occasions, to the activities of the average hobby printer; calling cards and stationery for mother and other non-critical relatives, and the usual witty sayings, mottos and cliches smeared in many colors over 3X5 cards. Early in my printing career I did try my hand at publishing a weekly paper. The limitations, however, imposed by a small font of 8 point Cheltenham Bold Condensed as body type and 12 point Shaded Old English for the banner and headlines combined with those unique to a 3X5 Kelsey Press quickly dampened my dreams of journalistic fame. Years later, in my first business venture, a Pilot Press did yeoman service in supplying me with all my business forms and in providing me with a way of informing my customers each week of the advantages that would

Trials, c. 1961, p. 1

accrue if they continued to deal with me. This was one of the rare occasions.

A little over a year ago, when sickness temporarily curtailed some of my more vigorous activities, I turned to printing for relaxation and now it is more of an obsession than an avocation. I discovered many of the joys of fine craftsmanship and the almost unlimited opportunity for creative exercise in printing. I also discovered that there were local and national organizations of hobby printers. Now I find that in *It's a Small World* there is opportunity for international exchange. The Private Press is by no means dead; rather it is very vigorous and rapidly growing. This puts me at a great disadvantage, for not only must I try to produce a wide variety of ephemera, but also I must become thoroughly acquainted with all that has transpired during the past 500 plus years. No little task, you must admit, especially when one wants to do it all in one year.

Two problems continually plague me, good copy and time to execute it as well as I think I can. I find that I can spend many long, albeit pleasant, hours searching through library files and stacks for interesting and unpublished manuscripts — one thing leading to another. Unfortunately, I haven't yet developed the patience to set and reset, if necessary — to ink and re-ink — to impress again and again and examine each sheet carefully with a magnifying lens until perfection is obtained. But that must be obvious by now.



Trials, c. 1961, p.2

Glossary

Bliss; Follow your bliss: These favored Joseph Campbell terms capture the ecstasy and fulfillment of being human and doing what makes you feel complete and whole. They exemplify intrinsic motivation and reward. Joseph Campbell had his own way of describing it:

> Follow your bliss. If you do follow your bliss, you put yourself on a kind of track that has been there all the while waiting for you, and the life you ought to be living is the one you are living. When you can see that, you begin to meet people who are in the field of your bliss, and they open the doors to you. I say, follow your bliss and don't be afraid, and doors will open where you didn't know they were going to be. If you follow your bliss, doors will open for you that wouldn't have opened for anyone else…

Creativity: The ability to transform or transcend traditional ideas, rules, patterns, methods, and interpretations in ways that reflect originality, novelty, and imagination.

Either-Or; Both-And: Our mental life contains numerous conceptual and emotional oppositions that can make us feel at times in conflict with ourselves or others. Am I smart or am I dumb? I am good; he is bad. Often the "either-or" framing is an unhelpful way to form a question, because you can be both at the same time: I am smart about how to make delicious cakes but not so smart about

knowing the names of all the Presidents of the United States.

When you come to appreciate how you can hold in your mind two opposing concepts or emotions at the same time you will find the "both-and" way of thinking quite helpful in coming to terms with apparently contradictory or opposing states of being. How can I both love and be so angry with you at the same time?

Opposites do not necessarily mean conflict, and can coexist side-by-side in an integrated fashion. In acknowledging the situation, you have opened your mind to another way to think about them, one that you may not have considered before but now proves useful to your understanding.

Ethos: The ethos of the 1960s example would include the anti-war protests and the advocacy of love and peace from the hippie movement. It covers the salient moral and ethical aspects of the time.

Holism: Complex systems, like living organisms (and inorganic systems as well), acquire properties that the subcomponents lack. Hydrogen and oxygen are gases in our atmosphere, yet when in combined, form liquid water. Another way of saying that, is that the whole is greater than the sum of its parts. Individuals use their eyes to see, but the seeing occurs in the brain and not in the eyes. Similarly, we are individuals who live in families and communities and nations, each differs from the other. We have a past and a present. We have reasoning, emotions, imaginations, and playfulness. At all times we are surrounded by a context which influences us. As much as we might think otherwise, we are not completely independent of our environment. Hence a biography is always about more than just an individual.

Human Beings: We are complex, contradictory, inconsistent, always changing, moody, playful, humorous, rational, illogical, and much more, all at the same time. We are filled with oppositions both physical, like health and sickness, and mental, like satisfied and dissatisfied at the same time.

Simultaneously we can be a blending of extremes, like partially healthy and partially sick, or pleased with ourselves in one way but not in another. The oppositions help explain why we can be so complex and contrary and mysterious, so difficult to understand, all at the same time. We are not just rational beings; we are emotional ones too, all wrapped up in one package.

Human Potential: The undeveloped or under-developed aspects of one's behavior and mentality are often referred to as potentials waiting optimal development, especially curiosity, imagination, empathy, playfulness, creativity, and resilience. Their full attainment, signifying the idealized state of self-actualization, is believed to be out of reach for the overwhelming majority of us but worth moving towards, nonetheless.

Intangible to Tangible: The generalized inventive process of moving an idea from its invisible mental state to its more palpable concrete state. It may seem magical that out of thin air come new industries that ultimately employ hundreds of thousands of people producing wealth and well-being for the many. Look no further than to Silicon Valley's developmental history for validation of this process as a real one.

The flow is reversible as well. Words on paper can enter our minds, transformed into ideas and memories. Music that makes us feel a thought does the same tangible to intangible trip. Metaphors are created by applying a characteristic of a tangible object (a fearless lion) to a different object (a lion-hearted soldier) as a means of communicating meaning and understanding.

Intrinsic motivation and rewards: An activity pursued for its own sake, often with pleasure as we perform the activity, is said to be intrinsically motivated and rewarding. Hobbies can be like that, as can any risky and daring creative project that turns out well. Work is the classic activity associated with extrinsic motivation and reward. Enjoyment is associated with the reward, not the activity.

Polymath: A person with deep learning in two or more areas of knowledge, each considered distinct from the others, with little overlap between them. Polymathy assumes that all areas of knowledge, while superficially appearing unrelated to each other, can overlap to a degree. As interrelationships are uncovered between groups, knowledge advances.

Leonardo is considered to be an epitome of polymathy, being expert in human anatomy and fine arts, among many other areas. His artistic ability to portray humans benefited from his postmortem anatomical examinations while establishing the groundwork for the medical study of human anatomy.

Here is how Noble laureate Glenn T. Seaborg sees it:

> There is beauty in discovery. There is mathematics in music, a kinship of science and poetry in the

description of nature, and exquisite form in a molecule. Attempts to place different disciplines in different camps are revealed as artificial in the face of the unity of knowledge. All literate men are sustained by the philosopher, the historian, the political analyst, the economist, the scientist, the poet, the artisan, and the musician.

Self-Actualization: A concept popularized by psychologist Abraham Maslow that represents humanity's striving towards an optimal state of well-being that presumably awaits those who fully develop their capabilities of autonomy, competence, and relatedness to others. Highly creative humanitarians are exemplars of self-actualization. They have satisfied their more basic needs of food, shelter, safety and are progressing up a pyramid of emotional needs for belonging, love, and self-esteem onward to a peak of inner and outer fulfillment and completeness.

Transcendence: The spiritual ability to rise above earthly needs and concerns, as when one experiences feelings of profound peace and harmony, unknown in everyday experience. When the term is used in mundane circumstances it refers to **transformation**, instances in which an individual has been able to improve emotional, affective, or conceptual aspects of behavior that has been judged to be objectionable.

Zeitgeist: A German word that refers to the implicit spirit of an era as it pertains to intellectual or cognitive aspects. Identical simultaneous inventions imply an origin located in the zeitgeist accessible to many. The zeitgeist of

the 1960s was largely defined by the civil-rights movement, the sexual revolution, and the counter-culture movement.

References

Anderson, H. H. (Ed.). 1959. *Creativity and its Cultivation*. New York: Harper & Bros.

Arnold, J. E. Box Car Design Project. Undated. Cambridge: MIT Dept. of Engineering; ASEE Engineering Case Library, Retrieved from: Internet Archive: https://archive.org/details/ECL1-5.

Arnold, J. E. 1953. Space, time and education. *Astounding Science Fiction.* May, pp. 9–25; Introductory remarks by J. W. Campbell, Jr., editor, pp. 9–10. Reprinted in Arnold, J. E. (1953) 2016.

Arnold, J. E. (1953) 2016. *Case Study: Arcturus IV*. In J. E. Arnold (Ed.), *The Arcturus IV Case Study.* Edited with an introduction by J. E. Arnold, Jr. Stanford University. Engineering Case Program (1948-1972). Retrieved from: Stanford Digital Repository: http://purl.stanford.edu/rz867bs3905 and Internet Archive: https://archive.org/details/ArcturusIvCaseStudy.

Arnold, J. E. (1959) 2016. *Creative engineering: promoting innovation by thinking differently.* Edited with an introduction and biographical essay by W. J. Clancey. Retrieved from: Stanford Digital Repository: http://purl.stanford.edu/jb100vs5745.

Arnold, John E. & Ling, A. T. Rice in Burma. Undated. Retrieved from: Internet Archive: https://archive.org/details/SC0269B01109RiceInBurma.

Arnold, J. E. Jr. & Paulsen, T. H. 2003. *The Paulsen saga*. Unpublished.

Babcock, H. W. & Davis, E. L. 1954. Design case study: Project Ceres 1. Creative Engineering Laboratory, Mechanical Engineering Department, Massachusetts Institute of Technology. Retrieved from: Internet Archive: https://archive.org/details/SC0269B01ECL001008ArnoldCERES.

Barrett, L. F. 2017. *How emotions are made: the secret life of the brain.* Boston & New York: Houghton Mifflin Harcourt.

Barry, J. M. 2004. *The great influenza: the epic story of the deadliest plague in history. New York: Viking*.

Campbell, J. J. 1949. *The hero with a thousand faces*. New York: Pantheon Books.

Campbell, J. J., Moyers, B. D. & Flowers, B. S. (Eds.). 1988. *The power of myth*. New York: Doubleday.

Clancey, W.J. Arnold, J. E. (1959) 2016. Arnold, J. E. (1959) 2016. *Creative engineering: Promoting innovation by thinking differently*. Edited with an introduction and biographical essay by W. J. Clancey. Stanford Digital Repository. Available at http://purl.stanford.edu/jb100vs5745.

Clancey, W. J. (Ed.). 2024. *The philosophy of comprehensive design: the collected articles and speeches of John E. Arnold*. Manuscript in preparation. (Original work 1954–1961).

Csikszentmihályi, M. 1988. *Flow: the psychology of optimal experience*. New York: Harper and Row.

Dewey, J. 1897. "My Pedagogic Creed." *School Journal,* 54 (3), 77-80.

Doorley, S., Cavagnaro, L. B. & Solomon, L. K. 2021-2022. Building future foundations. Stanford d.school Yearbook, (pp. 99-105) Hasso Plattner Institute of Design at Stanford University.Retrieved 31 March 2024 from: https://dschool.stanford.edu/resources/yearbook-2021-22.

Gallwey, W. T. 1974.*The inner game of tennis: the classic guide to the mental side of peak performance*. New York: Random House.

Garner, D., Jacobs, A., & Szalai, J. 2024. "22 of the Funniest Novels Since 'Catch 22.'" *New York Times Book Review*, March 17.

Gawande, A. 2014. *Being Mortal*. New York: Metropolitan Books.

Gladwell, M. 2008. Something in the air. *The New Yorker. May 12.*

Guest, E. A. 1919. *The path to home*. Chicago: Reilly and Lee.

Harmon, W. W., McKim, R. H., Mogar, R. E., Fadiman, J. & Stolaroff, M. J. 1966, Psychedelic agents in creative problem solving: a pilot study. *Psychological Reports*, 19, 211-227.

Hoover, H. C. 1948. Address at the Dedication of the Herbert Hoover Presidential Library. Remarks by telephone from New York City to Wilmington College, Ohio. November 11. Retrieved 11 September 2023 from: https://hooverpresidentialfoundation.org/speeches/on-the-uncommon-man/.

Hunt, M. M. 1955. The course where students lose earthly shackles. *Life.* 38 (20), May 16. 186-188, 190, 195-196, 198, 200.

Huxley, A. L. 1954. *The doors of perception*. New York: Harper & Row.

Jaynes, J. 1976. *The origins of consciousness in the breakdown of the bicameral mind*. New York: Houghton Mifflin.

Kays, W. M., Bulkeley, P. Z., & Pederson, C. A. 1963. Memorial resolution—John E. Arnold (1913-1963). Stanford University, Department of Mechanical Engineering. Retrieved from: https://stacks.stanford.edu/file/druid:ry675zz4929/SC0193_MemorialResolution_ArnoldJ.pdf

Maslow, A. H. 1954. *Motivation and personality*. New York: Harper.

McKim, R. H. 1972. *Experiences in visual thinking*. Monterey: Brooks/Cole Publishing.

Morrow, D. 1995. The Steve Jobs 1995 Interview Unabridged. Retrieved from:https://archive.org/details/TheSteveJobs1995InterviewUnabridged.

Murphy, M. 1992. *The future of the body: explorations Into the further evolution of human nature*. New York: Jeremy P. Tarche/ Putnam.

Pollan, M. K. 2018. *How to change your mind: what the new science of psychedelics teaches us about consciousness, dying, addiction, depression, and transcendence*. Kindle Books. Penguin Group. USA.

Rogers, C. R. 1953. Toward a theory of creativity. In M. Barkan & R. L. Mooney (Eds.)*, Conference on creativity: a report to the Rockefeller foundation (pp. 73–82)*. Columbus: Ohio State University Press. Revised as Rogers (1954).

Rogers, C. R. 1954. Toward a theory of creativity. *ETC: A Review of General Semantics*, 11(4), 249–260. Reprinted in Anderson (1959, pp. 69–82); Rogers (1961, pp. 347–359); Vernon (1970, pp. 137–152).

Rogers, C. R. 1961. *On Becoming a Person: A therapist's view of psychotherapy.* Boston, MA: Houghton Mifflin.

Rölvaag, O. E. & Concord, L. (trans.) 1927. *Giants in the earth: a saga of the prairie.* New York: Harper & Brothers.

Rovelli, C. 2016. *Seven brief lessons on physics*. New York: Riverhead Books.

Rovelli, C. 2019. Send Us Your Questions for Carlo Rovelli. *The Guardian*. 2019. Retrieved from: https://www.theguardian.com/science/2019/mar/05/send-us-your-questions-for-carlo-rovelli.

Satir, Virginia. 2001. *Self esteem*. Berkeley, CA: Celestial Arts.

Seuss, Dr. 1990. *Oh, the places you'll go!* New York: Random House.

Sheridan, T. B. & Arnold, J. E. Undated. Zylerium blindness. In W. J. Clancey (Ed.) *The philosophy of comprehensive design: The collected articles and speeches of John E. Arnold*. Manuscript in preparation. (Original work: 1954-1961)

Vernon, P. E. (Ed.) 1970. *Creativity.* Harmondsworth: Penguin.

Wikipedia contributors. 2024. Charles Dickens. In *Wikipedia, The Free Encyclopedia.* Retrieved from: https://en.wikipedia.org/w/index.php?title=Charles_Dickens&oldid=1207732228. Feb. 18.

Wilczek, Frank. 2021. My mystical moment. Retrieved from: Edge Foundation: *https://www.edge.org/conversation/frank_wilczek-my-mystical-moment*. May 18.

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